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Advisory Committee  
Northern Development  
North of 60°

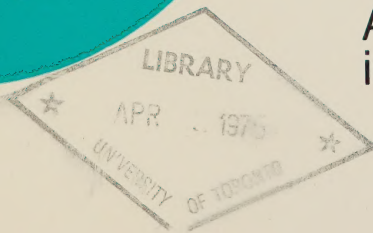
Comité consultatif  
mise en valeur du Nord  
Au nord du 60<sup>ième</sup>

Advisory Committee on Northern Development.

32



1973-74  
Government  
Activities  
in the North







# 1973-1974 Government Activities in the North

1973-74 Report and 1974-75 Plans

Advisory Committee  
on Northern Development

This report is also available  
in French  
Cette publication existe aussi  
en version française

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Publications





## FOREWORD

Much of the material used under the headings "Plans for 1974-75" had to be assembled in the latter part of the fiscal year 1973-74. By the time this document is published, many of these plans will be "fait accompli"; others may have been severely modified or abandoned. It is not practicable to constantly review the status of these plans as publication of the book proceeds; consequently, they are treated throughout as being in the future.



## MEMORANDUM FOR THE ADVISORY COMMITTEE ON NORTHERN DEVELOPMENT

Document ND 524

### Government Activities in the North-1973-74 and Plans for 1974-75

On January 22, 1953, the Cabinet directed that the Advisory Committee on Northern Development report immediately and periodically thereafter on all phases of development in the Canadian north. The Committee agreed the report should be brought up to date on an annual basis.

This current report covers the activities of all federal departments and agencies operating in the Yukon and Northwest Territories for the fiscal year 1973-74. In the past the report has been issued each calendar year. This policy has been changed and this and future issues will cover the activities of the previous fiscal year and outline plans for the next. It is believed that this change will facilitate the gathering of information and its correlation with national statistics.

Thanks to the co-operation of its many contributors, the report has increased in popularity and is widely used as a work of reference.

It is unclassified and copies can be obtained in either French or English by writing to the Information Services, Department of Indian Affairs and Northern Development, Ottawa, Ontario K1A 0H4.





## TABLE OF CONTENTS

Advisory Committee on Northern Development . . . . .	9	Eldorado Nuclear Ltd . . . . .	128	Unemployment Insurance Commission . . . . .	175
Canada Department of Labour . . . . .	12	Government of the Northwest Territories . . . . .	129	Appendix . . . . .	176
Canadian Broadcasting Corporation . . . . .	15	Department of Local Government . . . . .	130	Government Expenditures on the North . . . . .	177
Canadian National Railways . . . . .	34	Department of Education . . . . .	131		
Canadian Transport Commission . . . . .	36	Department of Social Development . . . . .	131	N.B. Map on Inside Back Cover.	
Central Mortgage and Housing Corporation . . . . .	37	Department of Economic Development . . . . .	132		
Crown Assets Disposal Corporation . . . . .	39	Department of Administration . . . . .	133		
Department of Agriculture . . . . .	40	Department of Public Services . . . . .	134		
Department of Communications . . . . .	42	Department of Information . . . . .	135		
Department of Energy, Mines and Resources . . . . .	45	Department of Public Works . . . . .	136		
Mineral Development Sector . . . . .	45	Executive Secretariat . . . . .	137		
The Canada Centre for Remote Sensing . . . . .	46	Clerk of the Council . . . . .	138		
Earth Physics Branch . . . . .	48	Government of the Yukon Territory . . . . .	139		
Geological Survey of Canada . . . . .	50	Administration of the Yukon Territory . . . . .	139		
Mines Branch . . . . .	54	Council of the Yukon Territory . . . . .	139		
Resource Management and Conservation Branch . . . . .	56	Administrative Support Services . . . . .	139		
Task Force on Northern Oil Development . . . . .	56	Administrative and Legislative Support Services . . . . .	140		
Surveys and Mapping Branch . . . . .	57	Department of Education . . . . .	141		
Polar Continental Shelf Project . . . . .	62	Department of Health, Welfare and Rehabilitation . . . . .	143		
Department of the Environment . . . . .	68	Department of Highways and Public Works . . . . .	147		
Atmospheric Environment Service . . . . .	68	Department of Legal Affairs . . . . .	149		
Fisheries and Marine Service . . . . .	73	Department of Liquor Control . . . . .	149		
Environmental Management Service . . . . .	77	Department of Local Government . . . . .	149		
Environmental Protection Service . . . . .	83	Department of Territorial Secretary and Registrar General . . . . .	151		
Planning and Finance Service . . . . .	85	Department of Tourism, Conservation and Information Services . . . . .	152		
Department of External Affairs . . . . .	88	Department of Treasury . . . . .	154		
Department of Indian Affairs and Northern Development . . . . .	90	National Energy Board . . . . .	155		
Indian and Eskimo Affairs Program . . . . .	90	National Film Board . . . . .	156		
Northern Natural Resources and Environment . . . . .	93	National Museums of Canada . . . . .	158		
Parks Canada . . . . .	100	National Museum of Natural Sciences . . . . .	158		
Northern Policy and Program Planning Branch . . . . .	104	National Museum of Man . . . . .	159		
Territorial and Social Development Branch . . . . .	107	National Research Council of Canada . . . . .	162		
Department of Justice . . . . .	111	Northern Canada Power Commission . . . . .	165		
Department of Manpower and Immigration . . . . .	112	Northern Transportation Company Limited . . . . .	166		
Department of National Defence . . . . .	114	Post Office Department . . . . .	168		
Canadian Armed Forces . . . . .	114	Royal Canadian Mounted Police . . . . .	169		
Defence Research Board . . . . .	116	Transport Canada . . . . .	170		
Department of National Health and Welfare . . . . .	121	Arctic Transportation Agency . . . . .	170		
Health Programs Branch . . . . .	121	Canadian Air Transportation Administration . . . . .	171		
Medical Services Branch . . . . .	122	Civil Aeronautics . . . . .	171		
Social Allowances and Services Branch . . . . .	123	Airports and Construction Services Branch . . . . .	172		
Department of National Revenue . . . . .	124	Canadian Marine Transportation Administration . . . . .	173		
Customs and Excise . . . . .	124	Canadian Surface Transportation Administration . . . . .	174		
Department of Public Works . . . . .	125	Transportation Development Agency . . . . .	174		





# ADVISORY COMMITTEE ON NORTHERN DEVELOPMENT (CND)

## Responsibilities:

To advise the government on policy relating to civilian and military undertakings in northern Canada and to provide for effective co-ordination of all government activities in that region.

## Review of 1973-74 Operations

The Advisory Committee on Northern Development under the Chairmanship of Mr. J. Robinson, Deputy Minister of IAND, established one new committee and acquired other under its jurisdiction:

Federal-Territorial Economic Planning Committee

*Chairman:* A.D. Hunt

Interdepartmental Advisory Committee on Northern Roads

*Chairman:* A.B. Yates

The following sub-committees and related working groups were active in 73-74:

## Co-ordinating Committee

*Chairman:* Mr. G.S. Murray, DIAND

## Terms of Reference:

To propose specific programs for the development of the northern territories in order to co-ordinate these programs into a general plan;

To consider and advise on all proposed programs and studies which may have a major bearing on the development of the northern territories;

Where required, to establish "ad hoc"

working groups to consider particular aspects of northern development; and

To circulate relevant information and to

Advise senior officers of those departments and agencies with northern

interests on those aspects of northern development discussed in committee.

## Working Groups:

- Archaeological Salvage
- EOS Project
- Financial Implications of the Northern Development Policy
- Post-Operational Phase Dewline

## Sub-Committee on Transportation

*Chairman:* Mr. M. Hagglund, Ministry of Transport

## Terms of Reference:

- To review, examine and report on transportation requirements in all its forms for the northern territories.
- To submit both short and long term plans for transportation in the North, including recommendations in which these shall be met.

## Steering Group — Marine Transport

## Working Groups:

- Supply of Petroleum, Oil and Lubricants in the North
- Aesthetic Pollution in the Arctic
- Containers

## Sub-Committee on Science and Technology

*Chairman:* Dr. J.D. Keys, National Research Council

## Terms of Reference:

- To discuss and exchange information on the research programmes and projects, active or planned, of government and other agencies in northern Canada, and to consider the trends of northern research in other countries and their effect on Canadian programs;
- To release through the Advisory Committee on Northern Development periodically a list of all these research programs and projects including a forecast of any plans for future work, for the information

of the Committee and other government agencies;

- To recommend to the Advisory Committee on Northern Development additional research when this is considered to be desirable;
- To assist, at the request of interested departments, in providing or improving upon transportation or other facilities needed to further research programs in the north;
- To consider the possibility of common use of the research facilities of government departments and agencies.
- To consider any other aspect of research in the Canadian North as may be referred to it by the Advisory Committee on Northern Development;
- To consider and advise on all federal research programs pertaining to the North, with the view that the programs be appropriately related to the federal government's overall development plans in the North.

## Executive Group

## Standing Committee on Research Projects

- Task Force on Construction in Permafrost Regions

## Working Groups:

- Canada-USSR Scientific Agreement (General Exchanges Agreement)
- Scientific Guidelines for Federally-Sponsored Scientific Activities in Northern Canada
- Scientific Facilities in the North
- Ad Hoc Sub-Committee on an Arctic Bibliographic Information System.

## Sub-Committee on Northern Communications

*Chairman:* de M. Marchand, Department of Communications

**Terms of Reference:**

- To advise the government, through the advisory Committee on Northern Development, on questions of policy relating to civilian and military communications undertakings in northern Canada;
- To provide for the effective co-ordination of all government communications activities in northern Canada including responsibility for making recommendations on priorities between competing government programs;
- To review and assess, where appropriate, on-going government communications programs in northern Canada to assist departments and agencies in meeting the objectives of the Policy for Northern Communications and the Northern Development Policy, 1971-1981;
- To initiate, where appropriate, studies to evaluate possible policy changes or new program developments in northern communication in order to keep pace with new technology, taking into account social and cultural concerns, and to ensure compatibility with changing northern needs.

**Working Group:**

- Radio Broadcasting
- Anikinfo Project
- NWT Telecommunications

**Sub-Committee on the Employment of Native Northerners**

*Chairman:* Mr. S.W. Hancock, Northwest Territories

**Terms of Reference:**

- To review the availability of relevant data and make recommendations on content, collection and updating;
- To make recommendations on the nature and level of training required to increase employment opportunities for native northerners;
- To identify the legal, administrative and other impediments, where they exist, to the implementation of government objectives in the field of employment and economic opportunities for native northerners and make recommendations for their removal;
- To consider innovative approaches to the employment problems of native northerners, based on experience in Canadian and other jurisdictions;
- To encourage government departments and Crown agencies to undertake, either individually or jointly, special employment programs for native northerners;

- To establish consultative procedures with representative organizations of native people at all levels.

**Working Group:**

- Employment and Local Impact

**Environmental Committee of the Mackenzie Highway**

*Chairman:* Mr. L. Edgeworth, Department of the Environment

**Terms of Reference:**

- To consider the environmental requirements for the Mackenzie Highway Project and to make recommendations for amendment, as thought necessary, and to approve them;
- To consider and make recommendations concerning the final alignment and construction standards of the Mackenzie Highway and to approve them from the environmental point of view;
- To consider other environmental aspects of the Mackenzie Highway Project as may be referred to the Committee by the Mackenzie Highway Committee from time to time either for the purpose of independent advice, or to consider an environmental question that has not been unanimously agreed to by the Mackenzie Highway Committee;
- To receive reports from the Mackenzie Highway Committee on the construction of the Mackenzie Highway with respect to environmental aspects, and to make recommendations thereon;
- To consider and make recommendations to the Ministers concerned, through the Advisory Committee on Northern Development, on any environmental issues relating to the Mackenzie Highway which cannot be resolved with the Mackenzie Highway Committee.

**Federal-Territorial Economic Planning Committee**

*Chairman:* A.D. Hunt, Department of Indian Affairs and Northern Development

**Terms of Reference:**

- To establish guidelines for global and regional economic planning in the North to be undertaken by the Federal and Territorial Governments in accordance with the objectives and priorities in the Northern Policy;
- To ensure that there is an adequate information base on the North and matters affecting its development to enable governments to measure the

impact of programs and to undertake the required economic planning;

- To develop and initiate effective operations for the stimulation and support of sound enterprises to encourage industrial growth;
- To establish guidelines for programs to enhance economic opportunities and social advantages for native people and to ensure that their views are taken into account;
- To examine the possible applications of development boards and corporations and to initiate effective action on such structures which may be appropriate to the Territories.

**Interdepartmental Advisory Committee on Northern Roads**

*Chairman:* A.B. Yates, Department of Indian Affairs and Northern Development

**Terms of Reference:**

- To assess and advance proposals for specific Area Development Roads;
- To be responsible for reviewing the economic assessment of each sector and assessing the relative value of all road classifications referred to in the Northern Roads Policy.

**Co-ordinating Committee — Yellowknife**

*Chairman:* S.M. Hodgson, Commissioner, Northwest Territories

**Terms of Reference:**

- To provide a forum for the exchange of information regarding on-going governmental programs in the Northwest Territories;
- To provide a forum to which proposed new programs may be submitted for purposes of information and co-ordination;
- To identify *overlapping* areas of jurisdiction and programs, and co-ordinate a government programs in order to avoid the duplication of effort;
- To identify and attempt to resolve areas of program *conflict* or incompatibility;
- To identify needs which are not being met by any private or governmental agency and propose new programs and policies to meet those needs;
- To identify ineffective on-going programs and make recommendations for their improvement;
- In the event of conflicting interests which cannot be resolved by the sub-committee the matter will be referred to the Advisory Committee on Northern Development.

**Working Groups:**

Standing Group on Construction  
 Standing Group on Emergency Operations  
 Standing Group on Personnel Policy and Programs  
 Standing Group on Resources and Pipeline  
 Standing Group on Transportation and Communications.

**Federal-Interdepartmental Co-ordinating Committee-Whitehorse**

*Chairman:* J. Smith, Commissioner, Yukon Territory

**Terms of Reference:**

This committee should meet regularly to discuss matters of common interest, and where possible seek a common solution at that level. Each department or agency of government in the Yukon will be invited to nominate its representative. Minutes of these meetings will be prepared and distributed to these representatives in the Yukon.

In the event of conflicting interests which cannot be resolved by the committee, the matter will be referred to the Chairman of the ACND who will discuss it with the appropriate deputy minister in Ottawa or, if needed, refer the matter to the ACND for a recommendation.

**Steering Committee:****Working Groups:**

Sub-Committee on Communications  
 Staff Housing.

## CANADA DEPARTMENT OF LABOUR (LAB)

**Responsibilities**

The Department has one overall responsibility, which is to achieve economic and social progress with justice through the promotion of good industrial relations and improved working conditions. To further this basic responsibility, the Department's principal activities are designed to:

Settle industrial disputes and encourage co-operation between labour and management;

establish and maintain fair standards of wages, working conditions and safety in employment;

achieve equality of job opportunity and safeguard human rights in matters affecting labour;

provide research, statistical and information services in labour matters to unions, employers, government and the public;

promote and participate in national and international tripartite consultation in matters affecting labour.

**Long-term Plans**

Normal planning to meet responsibilities.

**Review of 1973-74 Operations****Industrial Relations****Conciliation and Arbitration Branch**

The Branch participates in labour relations in the Northwest Territories and the Yukon in connection with proceedings under Part V (Industrial Relations) of the Canada Labour Code.

**Activities**

1. Disputes referred to Conciliation Officers pursuant to Section 164 of the Code.
2. Disputes referred to Conciliation Commissioners pursuant to Section 166 (a) of the Code
3. Disputes referred to Conciliation Boards pursuant to Section 166 (b) of the Code
4. Provision of Mediation Services pursuant to Section 195 of the Code
5. Disputes arising over the interpretation, application or alleged violation of provisions of collective agreements whereby the Minister was asked to appoint an arbitrator or arbitration board chairman

**No. of Cases**

4

1

Nil

Nil

Nil

**The Fair Employment Practices Branch**

The Fair Employment Practices Branch of the Canada Department of Labour is responsible for investigating complaints of discrimination in employment on grounds of race, colour, religion or national origin in areas under federal jurisdiction and for promoting equal employment opportunity for disadvantaged minority groups.

During the 1973/74 fiscal year, a number of complaints involving local enterprises was referred to the Territorial jurisdictions and in one instance, in which a Public Service situation was the subject, the complaint was referred to the Anti-discrimination Branch of the Public Service Commission of Canada. It is expected that during the 1974/75 fiscal year, cooperation with the Special Staff group on Employment and Economic Development and other officials in the Department of Indian Affairs and Northern Development to plan initiatives to increase employment opportunities for native peoples in the North, will be continued.

**Employment Standards****Labour Standards Branch**

The following is a summary of the activities of the Labour Standards Branch in the North (Yukon Territory and Northwest Territories) during the fiscal year 1973-74:

**Federal Contracts**

(a) Inspections on Government Contracts  
During the fiscal year, 25 inspections were carried out by branch officers. Of these, 12 were made in the Northwest Territories and 13 in the Yukon Territory. These inspections directly affected 21 main contractors and four sub-contractors involving 182 employees. Wage adjustments were collected from five main contractors and four sub-contractors involving \$4,948.98 and 36 employees.

(b) Wage Schedules Issued



	NWT	YT	<b>The Accident Prevention and Compensation Branch</b>
Construction contracts	72	24	In addition to its long standing activities in the Yukon and Northwest Territories with respect to the administration of the Government Employees Compensation Act, the Accident Prevention and Compensation Branch has, during 1973/74, continued to make progress in the implementation of a comprehensive employment safety program on premises of employers subject to Part IV of the Canada Labour Code as well as in Public Service premises under the authority of the Occupational Safety Policy for the Public Service of Canada.
Service contracts	5	2	

### **Part III of the Canada Labour Code (Labour Standards)**

It should be noted that the provisions of Part III of the Canada Labour Code (Labour Standards) do not apply to a work, undertaking or business of a local or private nature in the Yukon Territory or the Northwest Territories. The Territorial Councils have issued ordinances respecting employment standards in activities that fall within their jurisdiction. Part III of the code does, however, apply to those kinds of businesses that normally come within federal jurisdiction when located in the provinces.

During the 1973-74 fiscal year, nine complaints were investigated under Part III of the Canada Labour Code (Labour Standards), of which one was in the Yukon Territory and eight in the Northwest Territories.

As a result of these investigations, the sum of \$1,754.27 was recovered for eight employees.

In the same period there were eight routine inspections carried out under the same authority, of which two were in the Yukon Territory and six in the Northwest Territories. Six of these were found to be in compliance with the code, in one case the person was considered to be self-employed, and in one case there was violation of Division IV with a recovery of \$139.00 for two employees.

In the Yukon Territory and Northwest Territories, responsibility for enforcement of legislation has been assigned to the Labour Standards Branch regional offices in Winnipeg, Edmonton and Vancouver, as follows:

Territory	Responsible Regional Office
Northwest Territories (west of 102° Longitude)	Winnipeg, Manitoba
Northwest Territories (east of 102° longitude)	Edmonton, Alberta
Yukon	Vancouver, British Columbia

Plans for the 1974-75 fiscal year, and anticipated results, will be similar to those of 1973-74.

### *Accident Prevention Division*

#### **Responsibilities**

Through the provisions contained in the Canada Labour Code, Part IV (Safety of Employees), the Accident Prevention Division is responsible for ensuring the existence of safe and healthful working conditions in federal works, undertakings and businesses. In the Federal Public Service, the Division monitors existing accident prevention programs and assists in their development and improvement in accordance with the Occupational Health and Safety policies issued by Treasury Board.

#### **Review of Activities**

Accident prevention activities in the Territories continued to increase in scope during 1973, particularly in the fields of safety program management training, accident investigations and technical surveys. The program conducted during the year and in previous years has begun to show significant results.

Two examples are improvements in the measures implemented to control accidents and injuries in the Northern Canada Power Commission and the Indian and Northern Affairs Department. The former has acted to upgrade procedures, practices and conditions revealed in a safety audit conducted by this Department in 1972. As a result of consultations during 1972 and early 1973, the Indian and Northern Affairs Department implemented many improvements in the accident prevention program of their Northwest Lands and Forests fire fighting operations. This resulted in a 42 per cent decrease in disabling injuries, no fatalities and no aircraft accidents as had been the case in previous years. In addition, fire suppression costs were halved in spite of a 53 per cent

increase in the number of fires reported the previous year.

Routine safety surveys to assess employment safety and health standards were conducted in approximately one hundred public service and federal enterprise locations in which group the majority of employees are located. These surveys included work sites at Yellowknife, Fort Smith, Hay River, Tuktoyaktuk and Inuvik in the Northwest Territories and centres along the Alaska Highway in the Yukon.

The existing safety inspection services agreement with the NWT was extended in 1973 to include the inspection of electrical installation in addition to boilers, pressure vessels and elevating devices already covered by the agreement. Inspectors of the Territorial Government acting on behalf of the Department, inspected 611 units. Similar inspections were made by special arrangement with the Yukon Territorial Government of 65 units in that Territory.

#### **Plans for 1974-75**

The program conducted in 1973/74 will be continued on an increasing scale in 1974/75. This includes technical and general surveys, safety program management training and routine inspections by Territorial personnel on behalf of the Canada Department of Labour.

Most major employment locations in both Territories are scheduled for safety liaison and safety visits. These work sites and others will be surveyed to assess employment safety and health conditions. Technical surveys to evaluate the exposure of employees to environmental hazards will be continued. Particular attention will be given in the coming year to work locations where noisy equipment such as chain saws, fire pumps and fork lift trucks are used.

Routine annual inspections of boilers, pressure vessels, elevating devices, and electric and gas installations, will be undertaken as necessary to meet the requirements of the regulations. Negotiations will continue with the Territorial Government of the Yukon towards concluding a safety inspection services agreement for the regular inspection of these installations.

#### **Long-term Plans**

Existing programs in the accident prevention field will be continued and extended to include those work locations not already covered. Routine safety visits will, in future,



automatically include the conduct of technical surveys such as evaluations of noise, toxic gases, illumination, etc., where field conditions suggest the need for such surveys. Safety program management work and safety training will be continued at all employment locations particularly where accident prevention activities have been assessed as less than satisfactory.

#### *Accident Compensation Division*

Claims for compensation for occupational injuries or diseases by federal government employees, usually employed in the Yukon and Northwest Territories, were received in the Branch, certified and forwarded to the Workmen's Compensation Board of Alberta for adjudication and payment under a federal-provincial arrangement. During the calendar year 1973, 428 claims were received and approximately \$211,500 in disbursements were made.

#### **Research and Development**

##### **Economics and Research Branch**

The Economics and Research Branch conducts an annual Survey of Wages and Working Conditions which covers all establishments in Canada having 20 or more employees. In 1973/74, this survey included 75 establishments in the Yukon Territory, and 86 establishments in the Northwest Territories. This survey will be carried out again in 1974/75, along with a survey, effective June 1, 1974, to obtain information on the distribution of employees by wage and salary rates in industries under federal jurisdiction in these two areas.

The Branch also maintains a file of collective agreements covering employees in the Yukon and Northwest Territories, and publishes some information on labour organization and union membership in these areas.

##### **Legislative Research Branch**

The Legislative Research Branch, in order to meet its objectives which include advisory and information services on matters pertaining to labour laws, issues publications and articles on a regular basis such as *Legislative Review*, *Labour Standards*, and articles in the *Labour Gazette*. These publications and articles cover all recent changes relating to laws, regulations and labour standards in Canada. In addition, the Branch initiated the *Labour Case Reporter* and the minimum wage paper, established regional desks, undertook a study on wage protection as well as a preliminary work for CASHRA of

which N.W.T. is a member, and provided expertise on the New Labour Ordinances of Northwest Territories and on the Human Rights and Standards Ordinances in the N.W.T.

The Branch intends in 1974-75 to increase its involvement in labour affairs by initiating more studies and responding to any further demand made by the Yukon and Northwest Territories.

## CANADIAN BROADCASTING CORPORATION (CBC)

## NORTHERN SERVICE RADIO STATIONS

CFFB FROBISHER BAY, N.W.T.\*

(1210 kHz/250 W)

CFWH WHITEHORSE, Y.T.

(570 kHz/1000 W)

CHAK INUVIK, N.W.T. (860 kHz/1000 W)

CHFC FORT CHURCHILL, Manitoba

(1230 kHz/250 W)

CFYK YELLOWKNIFE, N.W.T.

(1340 kHz/1000 W)

## NORTHERN SERVICE LOW-POWER RELAY TRANSMITTER STATIONS (LPRTs)

CFWH is the program centre  
for the Yukon LPRT\*\* Network:

Carmacks (990 kHz/40 W)

Mayo (1230 kHz/40 W)

Elsa (560 kHz/40 W)

Dawson City (560 kHz/40 W)

Clinton Creek (990 kHz/40 W)

Teslin (940 kHz/40 W)

Swift River (970 kHz/40 W)

Watson Lake (990 kHz/40 W)

Cassiar (1340 kHz/40 W)

Haines Junction (860 kHz/40 W)

Destruction Bay (940 kHz/40 W)

Beaver Creek (690 kHz/40 W)

Carro (1230 kHz/40 W)

CFYK is the program centre for  
the Mackenzie LPRT\*\* Network:

Hay River (1490 kHz/40 W)

Pine Point (880 kHz/40 W)

Fort Smith (860 kHz/40 W)

Uranium City (880 kHz/40 W)

Fort Chipewyan (1450 kHz/40 W)

Fort Providence (1230 kHz/40 W)

Fort Simpson (690 kHz/40 W)

Norman Wells (990 kHz/40 W)

Fort Good Hope (920 kHz/40 W)

Fort Resolution (1150 kHz/40 W)

Wrigley (1280 kHz/40 W)

Fort Norman (920 kHz/40 W)

Rae/Edzo (1200 kHz/40 W)

\*CBC Network connection via second audio channel of Satellite ANIK.

\*Unattended radio stations broadcasting from the Network.

## Northern Service

## Responsibilities

To provide a broadcasting service to meet the special needs of the people living in the North — native Indian, Inuit and Métis, and non-natives — and give them a sense of identity with the rest of Canada; and to inform the latter about the people of the North and developments there. The Northern Service discharges these responsibilities by means of medium-wave and shortwave radio and, to an increasing extent, television.

## Long-term Plans

## 1974-79 — The Years Ahead

To continue to extend radio and television services to those communities as yet unserved, and to improve the quality of programs, particularly for the native Indian, Métis peoples and the Inuit, by involving them more closely in planning and production.

Remote or isolated places of 500 population or more, not presently served by radio or television in English and in French, will

receive the CBC national network services by means of the Accelerated Coverage Plan over the next five years. This Plan was approved by the federal Cabinet on February 14th, 1974. The names of the places affected by the plan will be made public as the CBC files applications for licences to the Canadian Radio-Television Commission, (C.R.T.C.).

A "Northern Broadcasting Plan" has been drafted by the CBC for a select committee on northern communications composed of representatives from Indian Affairs and Northern Development, Communications Canada, Secretary of State, C.R.T.C., and the Government of the Northwest Territories. This plan, which depends upon the implementation of the Accelerated Coverage Plan, would extend radio coverage to those communities in the Territories and northern parts of the provinces with populations in excess of two hundred.

The basic objectives of the Northern Broadcasting Plan are:

- to provide radio service to communities in the North of 200 people or more as soon as possible;
- to provide television service to northern communities of 500 or more, as outlined in the Accelerated Coverage Plan;
- in both radio and television, to develop a broadcasting service designed to meet the special interests and needs of the people living in the various regions of the North, especially the native peoples;
- to facilitate the interchange of programs between the various sub-regions of the North; and,
- to provide for and support community broadcasting.

## Affiliated Station Tuktoyaktuk (600 kHz/1000 W)

NORTHERN SERVICE TELEVISION STATIONS FED BY SATELLITE  
(1973-74)

Station	On-air	Station	On-air
WHITEHORSE — CFWHT	Feb. 5, 73	FARO — CBDBT	Feb. 15, 73
WATSON LAKE — CBBAT	Feb. 5, 73	YELLOWKNIFE — CFYKT	Feb. 5, 73
CASSIAR — CBUET	Feb. 7, 73	URANIUM CITY — CBKAT	Feb. 8, 73
CLINTON CREEK — CBDCT	Feb. 27, 73	INUVIK — CHAKT**	Feb. 5, 73
DAWSON CITY — CBDDT	Feb. 22, 73	PINE POINT — CBEBT***	Feb. 5, 73
ELSA — CBKHT — 1	Dec. 24, 73	FORT SMITH — CBEAT	Feb. 5, 73
KENO — CBKHT	Nov. 22, 73	NORMAN WELLS — CBEDT	Feb. 12, 74
RANKIN INLET — CBECT*	Oct. 24, 73	FORT SIMPSON — CBEGT	Feb. 12, 74
MAYO — CBJHT — 2	Dec. 24, 73		

\*CBC Network connection via second audio channel of Satellite ANIK.

\*\*Television signal also picked up in AKLAVIK.

\*\*\*Television signal also picked up in HAY RIVER and FORT RESOLUTION.

In March 1974, the Northern Broadcasting Plan was approved in principle by the Select Committee and was being prepared for presentation to Cabinet for their approval and funding.

The CBC is now at a turning point in the North as new communications systems make it possible to provide its services to every community equipped to receive them. The delivery by Anik of live network television to selected communities illuminates, not overshadows, the extension of service to those communities still without it. Despite some problems, it remains the CBC's aim in the North to provide an adequate broadcasting service in radio and television suitable for the people living there. The provision of an adequate radio service continued to be the first priority, even though the extension and improvement of television coverage is a major concern. Television comes at the cost of illuminated manuscripts, radio at the price of paperbacks. Delivery of the two services together may be necessary, but each is being planned as a complementary part of the whole.

Current contracts with common carriers for land-line and microwave facilities permit the extension and improvement of the radio service in the Yukon and the Mackenzie District of the Northwest Territories. A recently introduced rearrangement of network configurations will ensure more suitable local service from appropriate sub-regional production centres and the installation of local transmitters at an

increased number of communities. An example of new configuration is the program feed to Fort Good Hope which is now fed from Inuvik instead of Yellowknife.

In late 1974 a new sub-regional radio network, served from the production centre at Inuvik, will come into being for the lower Mackenzie River and Delta communities. A local transmitter planned for Fort McPherson in 1974, and one for Fort Franklin for 1975, will be part of this network. The affiliated radio station at Tuktoyaktuk will also be included. In this way communities from Great Bear River to the mouth of the Mackenzie will be able to relate more easily to each other through the sub-regional program service of the Delta network.

In the same period the Mackenzie sub-regional radio network, served from the program production centre at Yellowknife, will be extended by the installation of radio relay transmitters at Port Radium on the west shore of Great Bear Lake and Coppermine on the Arctic coast at the mouth of the Coppermine River. In the Yukon a radio relay transmitter, served by the Yukon sub-regional network centred in Whitehorse, is planned for the new mining community of Ross River at the junction of the Ross and Pelly rivers.

An improved shortwave radio signal to the North is now possible with completion of a directional antenna array for the Northern shortwave service at Sackville, New Brunswick. The new array became operative

in November 1973. It harnesses the power of two new 250 kilowatt transmitters. Additional landline connections between Sackville and the Northern Service production centre at Montreal permit a 19-hour continuous daily service in place of the previous intermittent service of 8 1/2 hours daily. It is still too early to properly evaluate the improvements in reception which should result from the up-graded service. The extended northern shortwave schedule appears on pages 26—33.

## Review of 1973-74 Operations

Full national network television service now being transmitted at the 14 northern communities which originally received television service by means of four hours of videotaped programs provided by the Frontier Coverage Package (FCP) Service. Five additional satellite-fed television transmitters went on the air during the past year. These stations provide network television service to the communities of Elsa, Keno and Mayo in the Yukon, and Norman Wells, Rankin Inlet and Fort Simpson in the Northwest Territories.

The Federal Government's approval of the CBC's Accelerated Coverage Plan means that 23 additional northern communities will receive network television service within the next few years.

With completion of the Northern Service shortwave directional antenna array at Sackville, New Brunswick, in October, shortwave service was increased from 8 1/2 to 19 hours daily starting November 4th, 1973. These transmissions are broadcast on at least two frequencies at all times over the new 250 kilowatt transmitters.

The main technical developments in the North during the years were the phasing out of the last Northern Service Frontier Coverage Package television station at Elsa, Y.T., and the establishment of television stations at Keno and Mayo, Y.T., and at Rankin Inlet, Norman Wells and Fort Simpson, N.W.T.

## Review of CBC's Service to the North

## 1958-74 — Radio

Ask a Northerner where he heard the latest news. In all likelihood, he will say "CBC radio". If not radio, the chances are he will say "CBC television".

No other part of the country is so reliant upon CBC service. Most northern communities want or need it. Some have it; others await it.



From its inception in 1958, the strategy of the Northern Service was clear: start operations in the larger centres of the more accessible areas of the North, and develop a system of sub-regional radio networks linking the low-power relay transmitters (LPRTs) at the smaller centres in a given area to a mother station. Where this could not be done — where landline facilities did not exist — communities from Hudson Bay to the Pole were served by the CBC's Northern Shortwave Service transmitting from Sackville, N.B., programs fed from the Montreal production unit of the Northern Service.

The goals were straightforward:

- extend CBC coverage to an area of Canada that did not have it,

- provide a program service to meet the special needs and interests of the people of the North,

- give pride of place in programming to native northerners,

- employ local staff and artists,

- share northern experience with the nation by providing programs on the North to CBC networks in the South.

A major accomplishment of the CBC in the North is that its radio service has come to be so well regarded. With few exceptions, the CBC is the sole broadcaster in the North and must meet a wide range of needs, tastes and interests. It must, and does, program for men and both sexes; speaks in several Indian and Inuit languages as well as English and French; serves a public whose occupations vary from hunter and trapper to miner and missionary. If the Northern Service has a formula for success, it is to be found in its combination of local, regional and national programs, its open relationship with the public, and the place it gives in broadcasting participation and cooperation of all aspects of northern life. The people of the North are at home with CBC radio, it with them.

By 1970, the Northern Service was fast approaching a plateau in the conventional development of its radio operations. It had reached to the limit of line-company facilities. It was operating to the maximum of its technical manpower and financial resources. While in the 1970 to 1973 period the Northern Service was to attain new program heights and enter upon a fresh,

experimental phase in community broadcasting, essentially it was a period of consolidation and planning to extend and improve coverage in those areas which did not have a service, particularly the Keewatin District and the central and eastern Arctic.

In the years of its existence, since 1958, Northern Service radio had expanded rapidly throughout the two territories and the northern areas of the western provinces. The magnitude of this accomplishment may be measured by the fact that nearly every sizeable community in the Yukon and in the Mackenzie District of the Northwest Territories now has radio service. The Yukon Area LPRT Network, programmes from the program centre at Whitehorse, embraces every community of 200 or more with the exception of Ross River and Old Crow in the Yukon. The Mackenzie Area LPRT Network, programmed from Yellowknife, Northwest Territories, extends over 1,000 miles from Uranium City, Saskatchewan and Fort Chipewyan, Alberta to Inuvik, Northwest Territories, one hundred miles above the Arctic Circle. In the bleak terrain of the Arctic and sub-Arctic regions of the eastern Arctic where only Churchill, Manitoba and Frobisher Bay, N.W.T., have local CBC radio, the Northern Shortwave Service beams its programs to the isolated settlements and outposts rimming the mainland coast and islands from the head of James Bay to the tip of Ellesmere Island. Its daily service in Cree, Inuktitut, French and English still includes *NORTHERN MESSENGER*, (a program of personal messages), the origin of which dates back to the 1930s.

In June 1970 responsibility for service to Labrador was transferred from the Northern Service to the CBC's Newfoundland Region. During 1970 special network hook-ups were made between the Mackenzie network, the Northern Shortwave Service, and the radio stations at Churchill, Manitoba and Frobisher Bay, N.W.T., to carry live originations celebrating Centennial Year in the Northwest Territories and Manitoba. An Armed Forces space satellite system was used for the first time to transmit radio programs from the North on the Royal Family's visit to the Arctic to the CBC network "outside". In 1971, network service was extended from Inuvik to the CBC's newest and most northern affiliated station, CFCT, Tuktoyaktuk on the shore of the Arctic Ocean. At Rankin Inlet in the

Keewatin District of the Northwest Territories, the CBC collaborated with Bell-Northern Research and the Federal Department of Communications in a unique community experiment. Known as the "Comminterphone" project, a special telephone system was harnessed to a CBC radio transmitter enabling the local people to broadcast directly to the community from their homes by telephone.

In 1972 one of the CBC's new 250 kilowatt transmitters at Sackville, New Brunswick was used to boost the signal strength of the Northern Shortwave Service. The construction of a new directional antenna solely for the North was completed in November 1973.

In April 1973 program service by tape shipment and shortwave was extended to the FM radio station operated by the Inuit community at Baker Lake, N.W.T. Similar service was provided to the community-operated radio station at Pond Inlet, N.W.T., including daily news in Inuktitut and English by telephone from CBC's station at Frobisher Bay.

In broadcasting, the proof of production is in the programs. To sustain 19 hours service daily, of which Northern Service stations produce about 45 per cent locally, requires a tremendous effort by each station's staff of six announcer-operators, aided by casual employees and freelance performers. In the past four years their regular production has included every category of program. They have used every technique from open-line to documentary and free-form drama. They have produced every variety of music and song and kept Canadian content high. Each station has given voice to religious and political broadcasts and served as a forum for debate and discussion. They have developed new formats in information programming, and given emphasis to consumer affairs. They have gathered and broadcast local news and have filed news reports to the national network. They have broadcast the weather, time checks, stockmarket quotations, public announcements and personal messages. They have logged hundreds of hours of coverage of special events: local and federal elections, hamlet, town and territorial council sessions; conferences; carnivals; auctions and trade shows; sports events, from the Arctic Winter Games and the Top-of-the-World Ski Meet to softball and wrestling; emergencies; mercy flights; coroner's inquests; and tours by important people and personalities ranging from Her Majesty the Queen in 1970 to

Anne Murray in 1973. Most important of all, the Northern Service has continued to develop its programs in native languages, and broadened its cooperation with native organizations in the North to broadcast programs produced by them. (See native programs schedule at end.) The Northern Service schedules are made up of about 45 per cent locally or regionally originated programs, with the remainder taken from the English Services Division and the French Services Division. All stations broadcast an average of 133 hours per week.

During the past four years planning has moved ahead to take advantage of the technological breakthrough in northern communications afforded by Anik, Telesat Canada's domestic space satellite system, in both television and radio. In radio the first step came in February 1973 when, after 12 years' dependence on tape shipments and the shortwave service for its national programs, Station CFFB, Frobisher Bay, N.W.T., was connected by satellite to the English radio network. In January 1974 Rankin Inlet was connected for the same. In addition to English network programs, Anik is being used to feed programs from the South in Inuktitut and in French to Frobisher Bay. These programs are also available to other Northern Service stations and to non-CBC community stations, such as Baker Lake and Pond Inlet.

Access by community broadcasting societies to local transmitters on an experimental basis is being carried on at Fort Good Hope and Rankin Inlet. These experiments have not been in operation long enough for an evaluation of their effectiveness to have been made.

#### 1967-74 — Television

The extension of CBC radio in the North is still the first priority, but television has also entered the picture. In the South, CBC radio began in 1936. It took 22 years to arrive North of 60°. CBC television was launched in 1952. Fifteen years later, it reached the North. The shorter time lag for television shows how the North has changed, how its expectations have increased, and how the skilled work forces entering the North expect to find what they have been accustomed to "outside".

Industry and government have tried to stabilize this work force. It was primarily for that reason that the Frontier Coverage Package (F.C.P.) came to be developed by the CBC. The first F.C.P. television station

began operating at Yellowknife, N.W.T., in May 1967. It consisted of a transmitter linked to a videotape play-back machine. The four-hour evening service was made up of national shows recorded one week earlier at Calgary from the English network. There was no local input. By 1970, fifteen F.C.P. stations were operating from the Yukon to Labrador. Twelve of them were the responsibility of the Northern Service. With up to three stations to one tape circuit, the last station on the circuit telecast its programs three weeks after network release. Generally, the first hour's service was for children, the remainder directed to family and adult viewing. News, sports and special events — unless they were extraordinary — were excluded. In 1970, following a tour of the western Arctic by the CBC's Board of Directors, which included a public meeting at Yellowknife, certain improvements to the service were made. Identification material depicting the North went into the blank screen station-break periods between programs (where regular television stations normally carry commercials). A weekly feature film was included in the Package. Better selection and scheduling of programs was arranged. Expanding the hours of service was deferred until live network service could be effected via satellite. In August 1971, an F.C.P. station opened at Faro, Y.T., followed six months later by one at Frobisher Bay, N.W.T. It was the last F.C.P. station to be built. All told, 17 communities were receiving television from the 14 F.C.P. stations operated by the Northern Service when Anik was launched in November 1972.

Anik made the difference between delayed and full, live network service. One transmitter, 23,000 miles above Earth, meant that the northern frontier was no longer an obstacle. With one leap and split-second timing, the CBC could vault the barriers that had proved so formidable to Arctic travellers and explorers over the centuries. Through the space satellite system, CBC radio could be extended to hitherto unreachable communities, and live network television service could be provided to those equipped to receive it. For this, the CBC had been planning since a task force was appointed by the Federal Government in July 1967. Three of Anik's ten channels are reserved for the CBC: two to distribute English network television on Atlantic and Pacific times, and one for the French network. Agreement was reached on a base line of 25 remote locations, mostly in the North,

to be equipped with television receiving stations by Telesat Canada.

Following the successful launch of Anik on November 9, 1972, link-ups were made the North between Telesat's ground receiving stations and the transmitters of the CBC's F.C.P. stations. The morning of February 5, 1973, audiences in seven communities in the Yukon, Northwest Territories and northern British Columbia began viewing the English television network, live and in colour, for the first time. They were in Whitehorse and Watson Lake in the Yukon Territory and Yellowknife, Inuvik, Pine Point (including Hay River and Fort Resolution), and Fort Smith in the Northwest Territories, and Fort Nelson in British Columbia. Overnight the hours of service rose from four to 14. By February 27, another eight communities were viewing television service from the English network. They were Dawson City, Faro and Clinton Creek in the Yukon; Frobisher Bay in the Northwest Territories; Churchill in Manitoba; Cassiar in British Columbia; Uranium City in Saskatchewan and Goose Bay in Newfoundland. Subsequently, these communities were joined by Rankin Inlet, N.W.T. in October and Keno Hill, Y.T., in November. Watching the *Night National* and *Hockey Night in Canada* now became a new habit for northerners.

To advance live television to the North as quickly as possible, the program service of CBUT Vancouver was fed to stations in the Northwest on one of the English Service's channels on the satellite ANIK, and of CBHT Halifax to the Northeast on the other. This step was taken to offset the delay in the completion of the CBC's (satellite) Network Control Centre (N.C.C.) at Toronto, and in conformity with plans for a Northern Television Service in regional periods within the national television network service. By June 1, 1973, in response to requests by northern viewers, television service was extended after network hours to include late-night feature films. In the autumn of 1973 the Toronto N.C.C. assumed control of the distribution of the English television network service by satellite, and regional service to the North by CBUT Vancouver and CBHT Halifax ceased.

Inherent in this change of service was the need to provide material to program and fill all local and regional time periods on the network service distributed by satellite from the N.C.C. in Toronto. This amounts to about one hour of programs daily, plus all station break periods. The Northern Service



the absence of any capacity for the production of television material, has been using regional exchange programs, National Film Board films, off-air pick-ups from CBC stations in the South, and programs supplied by the CBC French Services Division in these periods since October 1, 1973. Additionally, no five-minute programs a week are being produced on a temporary basis in Montreal. These are *Tarqavut* in Inuktitut for use in the northeastern Arctic, and *Our North* in English for the northwest. Both are news and information programs.

Station break periods totalling about 40 minutes daily are now being filled with slides as well as music interludes, including some northern and native performances. Northern television Service identification, mainly in English but with some in French and Inuit, is also being used. Additional research is being carried out to locate program material of more relevance to the North such as films on health, weather and employment opportunities.

*Anikinfo*, a service of telecasting brief institutional announcements of northern interest, began in January, 1974. They were made mainly in English although some have also been made in the Inuktitut dialects, and the Indian languages of Slavey, Chipewyan and Dogrib.

A certain number of difficulties are being experienced with the new satellite distribution system causing irritation to northern viewers through repetitions of programs and late service messages and news traffic. Steps have been taken to resolve these difficulties and they should be cleared up by the end of 1974.

While preparations were being made for the start of the satellite feed, the Northern Service invited the three national native organizations, Inuit Tapirisat of Canada, the Native Council of Canada and the National Indian Brotherhood to participate in the planning. In the first stage all three groups were present for the screening of the types of available programs. Later, during stage two, when the formulation of the approach to the initial service was being considered, all three native groups declined to participate. Nevertheless, the three groups were asked to meet with the Northern Service to discuss content of, and make suggestions about, the production of the two five-minute programs mentioned above. Inuit Tapirisat took part.

Since November of 1972 the Northern Service has been cooperating in a pilot

project in community television broadcasting at La Ronge, Saskatchewan. It lent a camera and videotape equipment to two young social animators working in the Indian community there. They helped to train residents in producing television programs which were broadcast on the local F.C.P. television station. This project is continuing even though the local television station is no longer served by F.C.P., but is connected to the network by terrestrial microwave facilities. It will be at least another year before a complete evaluation of this operation can be made.

### 1973-74 Review of Some Local and Regional Programs and Activities

#### CFWH Whitehorse

*Yukon Eye-Opener* — The morning information radio program which puts the world in the ear of the Yukon listener, and braces him to the local scene. Within a brightly-paced format of word and music, *Eye-Opener* alerts the listener to local conditions and events, updates him with the latest news, and puts him on top of current issues. *Eye-Opener* includes sports, keeps watch of time, temperature and travel. It finds time for a variety of features calculated to provoke interest, arouse curiosity, stimulate mirth, cause reflection. There is music to stir the listener and set him humming. *Eye-Opener* touches cultural, social, economic and political bases. In scope, it ranges over local, regional, national and international environments. The program moves with the flow of audiences available, concentrating on information content. From 0700 onwards, *Eye-Opener* is live or lively whether in studio, on "remote", running recordings, or using "phone-out" techniques. Listeners are invited to participate by recording "phone-in" comments after the show for possible feed-back into another day's programs.

*Radio Noon* — augments and updates information conveyed in *Yukon Eye-Opener*. Within a more relaxed, more locally orientated format of words and music, it gives greater play to community events, happenings, and leisure activities. More time is spent on consumers' concerns, money matters, and market values. In addition to news, weather and sports, listeners are kept aware of highway conditions. During the second hour, *Radio Noon* encourages public expression on topical interests by means of "phone-in" technique, "Man-in-the-street"

approach, and studio interviews. In summer particularly, the program explores attractions and opportunities for Yukon holiday-makers and visitors.

*Consumers' Comment* — Views on the quality of life, goods and services in the Yukon. Well-researched broadcast material is prepared with the support of the local consumer association. It reflects the concerns of the public and assesses the quality, costs and performance of services and goods available in the Yukon. *Consumers' Comment* is incorporated into *Radio Noon*.

*Coin Français* — A program of news, other information and music to serve listeners who are French-speaking or bilingual.

*Northern Lights Storytime* — A potpourri of songs, stories, legends and poems; amusements and games, fun and fantasy along with simple insights into the real world. Active participation of young listeners is sought through the support of their parents, schools, and libraries. It is an imaginative program designed to help children develop a better understanding of human values and the world they live in.

*Yukon Song and Play Contests* — Annual song and play contests are held to encourage local talent. The *Song Contest* is staged on location at Whitehorse with a local band to perform or support performances. Prizes are awarded for the best three songs. From the *Play Contest*, the best three scripts are performed and broadcast over CFWH and prizes are also awarded.

*Special Events Coverage* — A number of special events are attended by CFWH staff and reported upon for broadcast purposes. Some of these were the Yukon and Faro Trade Shows; Discovery Day Gold Rush celebrations in Dawson City; the Polar Games; Curling Bonspiels, and the 12th Annual Canadian Judo Championships which were held for the first time ever in the North; the final Speakout Debate between Mayo High School and F.H. Collins School from Whitehorse (the latter won the trophy); and the Sourdough Rendez-vous Winter Carnival in Whitehorse, the first Klondike "Hootchinanny" Winter Carnival at Haines Junction, the Atlin Trappers Festival, the Mayo Winter Festival and the Faro Ice Worm Squirm!

*The Easter Program* of Handel's "Messiah" as performed by the Whitehorse Choral Society was broadcast.

*Yukon Native Brotherhood Brief* — "Together Today for Our Children Tomorrow" was broadcast in a series of documentaries and followed by open line discussion. It featured as guests, Chief Elijah Smith, David Joe of the Brotherhood and Allen Luke, legal adviser to the Brotherhood. The series was later made into a two-part documentary and broadcast on the national radio network.

*Yukon Forest Service* — Forest fire reports, warnings and calls for help to fight the fires in both Territories are relayed by CFWH to the authorities and to the communities. In addition everyone is kept informed of the progress of suppression.

*Student Manager* — CFWH participated in Career Week at F.H. Collins School by treating one 12th grade student as acting area manager of the Yukon Network for a day. Out of 12 students in acting functions throughout Whitehorse, two were girls, including Cathy Fisher at CFWH.

#### CFYK Yellowknife

*The Morning Show* — sets out to be lively, informative and entertaining. Major emphasis is on information blocked in 20 minute cycles from 0700 onwards to give listeners in each cycle a rapid appreciation of news, current affairs, sports, weather and community events together with syndication and feature material interspersed with bright and cheerful music. Each morning, special interests at the different Mackenzie communities on the Network may be featured, occasionally on "phone-out".

*More Than Music* — provides a forum for discussion and appreciation of local issues and concerns in the Mackenzie area. This is a public affairs program combining the open-line technique with in-studio (station or remote) conversation with selected guests. The open-line technique permits free inquiry and comment by listeners together with "phone-out" calls to informed and interested listeners.

*On The Move* — The first segment of this program takes into consideration the tastes of the after-school crowd with pop and country and western music. A hit parade is compiled by school students in each LPRT community and phoned into the station weekly. The latter part of the program follows a "rolling home" type format with weather, sports, stock quotes, and focus on money matters and syndicated material along with music and news.

*Territorial News Roundup* — gives highlights of the week's newscasts in a half-hour

program which is also sent on to the Montreal Production Centre of the Northern Service for inclusion on shortwave broadcasts.

*Special Music Shows* — *Mackenzie Charger*, produced by Maurice Chobotar, is a hit parade program followed by comprehensive coverage of sports activities in the Territories. *Square Dance Notebook* is an information program for those square dance clubs organized in the communities served by CFYK. It includes music and calls by the host Bob Fyfe.

*Special Events Coverage* — included the Caribou Carnival at Yellowknife; the Oopkik Carnival at Hay River; the Wood Buffalo Frolics at Fort Smith; live broadcast of the annual Boy Scout Auction; the Anne Murray Show, where the 800 seats were sold within 15 minutes of going on sale one week in advance; Armed Forces Day, which involved a live broadcast from the Yellowknife Airport where the displays and air show took place; Walkathons in Fort Smith and Yellowknife; and the Canada Day celebrations, a three-hour broadcast from CFYK's remote unit at Petitot Park in Yellowknife with reports also coming in from Hay River and Fort Smith on activities held there.

*Special Interviews* — Visitors to the Northwest Territories were interviewed as they passed through Yellowknife — three visitors from Seneca College in Willowdale, Ontario who were part of a Canadian Studies Program on a five week tour of the North; Wade Rowland a Canadian author of several books, who was travelling across Canada by motorcycle gathering material for a new book about travelling to the "out of the way" places in the country; a group of ten students from the Adult Education Program who had just completed a tour of the Arctic Islands and southern Canada; a number of students and officials from Akaitcho Hall in Yellowknife, a hostel for students from all over the Territories who come there to complete their high school education. These interviews were conducted with the objective of putting together a half-hour program about the changes that take place in the lives of the students who have left their home settlements and families for the school term.

*Indian Land Caveat Application Hearings* — These hearings were covered by CFYK staff who travelled with the Supreme Court of the N.W.T. to 16 different settlements around Great Slave Lake and the Mackenzie River Valley. Some of the old people who

were present when the Indian Treaties were signed in 1921 were interviewed for broadcast.

*The Mackenzie Pipeline Debate* — What has been termed the debate of the decade was carried live over the CBC Mackenzie Network for almost two hours, and then followed by a questions and answers period. Panelists answered questions from the floor and from various parts of the Territories via a toll free phone-in provided by CNT, on the topic of "Be it resolved that a railroad is a viable alternative to a pipeline down the Mackenzie Valley". Heading the debating team for the affirmative was MP Wally Firth and for the negative Vern Horte, President of Gas Arctic. CHAK Inuvik also carried the broadcast.

*Territorial Council Sessions* — Both the 48th and 49th Sessions were reported upon by CFYK staff and broadcast daily on *Council Report* in English, Slavey, Chipewyan and Dogrib. News reports on the sessions were also fed daily to the national network programs, "The World at Six" and "The World at Eight".

#### CHAK Inuvik

*The Early Morning Show* — features Territorial News, the updated Evening Report and national and local sports scores, as well as music, syndicated material, weather and temperatures, native-language "drop-ins", community items and local news. This many faceted radio format enables each announcer/operator, full-time or casual, to gain experience in a fast-paced, "high-density" program.

*Easter Program* — A special Easter production was produced in Fort Good Hope and broadcast in Hareskin. It included songs, prayers and poems.

*Consumer Commentator* — encourages freelance comment on the quality of life in the Mackenzie Delta area, as well as research and investigative reporting with comment on the foods and services available.

*Perspective North* — was a series of 57-minute in-depth looks at issues of regional and national importance, with the emphasis on the North. Featured on the first program were, among others, the Honourable Jean Chrétien, Minister of Indian Affairs and Northern Development; Charles Heatherington, President of Panarctic Oil; Phoebe Nahanni of the N.W.T. Indian Brotherhood; Jim Lotz of the Coady International Institute; and, Richard Rohmer of the Mid-Canada Corridor Development Concept.



occasionally this program employed the open-line technique.

*Sports Events Coverage* — The "Top of the World Ski Meet" was relayed to CBC Yellowknife, CBC Whitehorse and CBC Edmonton as well as being broadcast over CHAK. Other major sports events covered were the Northern (Summer) Games held in Fort Good Hope; the International Curling Festival in Inuvik; the Delta Carnival; the yearly 1st Sports Events; and live and direct reports from the Inuvik Arena of the local hockey games. A lot of the players come from many different parts of the Delta to school in Inuvik. It is therefore of considerable interest to listeners throughout the Delta to broadcast hockey games whenever they are played.

*The Delta News* — Lois Keating, an experienced writer and 1971 Arctic Winter Games Native Participation Co-Ordinator, is busy researching and preparing *Delta News*. The program provides light community news and local information about the surrounding settlements. It keeps track of travellers, persons of interest, club activities, hunters' and trappers' travel, and other local topics. It also includes news letters from the outlying settlements.

*Direction Six* — is a program of music, interviews, and local, promotional and community affairs, interspersed with guest comments. Eskimo and Loucheux language reports are also featured, plus news and information.

*Trappers Program* — provides the latest information to trappers, hunters and traders about buying trends, fur prices, local regional trapping and hunting conditions; hints on various methods of carrying out the trades; exchanges of information from the southern traders and buyers; market items on guns, traps, and snaring equipment; items on game ordinances, opinions and views on the changing wildlife populations locally and regionally, as well as seasonal population trends for game birds and other wildlife. Dr. Sarah, a local medical officer, is a continuing feature on the program, discussing basic health and medication for hazards such as frostbite, blood poisoning and gangrene. An attempt is made to dispel myths about old ineffective cures and remedies, and to promote the use of modern but essential health precautions. The program is aimed mainly at practitioners of hunting and trapping skills, although fur traders and handicraft interests are catered to on occasion.

*Spring Break-Up* — Information on flooding during the spring is usually broadcast on the *Trappers' Program* to alert the local community and settlements served by CHAK.

*A Long Time Ago* — continued to be broadcast in Inuit and Loucheux with English translations. Producer Louie Goose makes his collection of legends and stories by taking advantage of the long memories and recollections of the Inuit, Indian and Métis old-timers whose parents depended upon passing stories from generation to generation when they lived on the land. During 1973 the program went to a twice weekly format. The legends and stories are being transcribed into English for future publication and educational purposes.

*Old Time Fiddle Music* — This program is now into its second year and is broadcast once a week. Some of the guests who have appeared are Charlie and Robert Linklater from Inuvik, Johnny Raymond from Paulatuk, the Reuben Family, Frank Cockner from Tuktoyaktuk, and some special guests from Arctic Village, Alaska.

*Evening Report* — continues with news 15 minutes daily, which is relayed to CFYK Yellowknife and often to the national network.

*Your Opinion and Mine* — a weekly five-minute sports program by Jarl Omholt-Jensen and Roger Gruben which ran for 13 weeks.

*The Lillian Dimitroff Show* — This consumer program included many on-air telephone interviews with interesting people such as the local medical officer of health following the CBC National Television Network program "VD Blues". Dr. Skinner gave his comments, talked about the problem in the North and stressed the need for prompt treatment, the use of VD vaccine, and sex education in the schools. Other topical subjects on the show were "Wills and Inheritance" which provided information on who should make a will, the cost of having a lawyer make it up, making your own and inheritance rulings; "Boating Safety", outlined the do's and don'ts of operating a boat safely and all the special hazards of northern boating; "Your Right to Complain", which brought in calls ranging from concern about shoddy goods and services to the dangers of poisoning; the types of books, stories and poems appropriate for the young reader; discussion of consumers' letters about the sale of stale chocolate Easter eggs, how to be vocal about

complaints, to make sure the manager knows you are dissatisfied and how to get your money back. Lillian Dimitroff also conducted a phone survey on the Educational Advisory Council Election when she supplied information about the Council, the candidates and eventually the election results. One open-line program topic of particular interest was "How Has Your Radio Listening Changed Since ANIK", which revealed that most listeners' habits have changed significantly regarding children and television. One of the callers said that he had his radio on all day and most of the evenings others felt that more promotion about radio programs and specials was needed; some wanted more late movies on tv, northern news people in on weekend programs and more northern content produced by northerners, especially local filming.

To CHAK's loss, Mrs. Dimitroff left Inuvik on June 29th to go to northern Alberta with her husband. Her creative program ability has been much appreciated.

*CHAK's Training Project* — took place as a special summer program because so many local young people have expressed an interest in a radio broadcast career. The cost was shared between CBC and the Territorial government. Six students from Aklavik, Fort Good Hope and Tuktoyaktuk took part under the direction of all the CHAK staff with special instruction from Keith Lawrence, the Program Planning Officer from the Director's Office in Ottawa.

A separate announcer/operator training project took place during the late winter of 1973, when the total cost was absorbed by the Territorial government. Instruction was provided by the CHAK staff.

Further projects of this kind are being encouraged to give young people the opportunity to work on-the-job and enable them to make an assessment of this type of career for themselves. As a result of these projects, four students will attend the Northern Alberta Institute of Technology to take the radio/tv arts or radio/tv technical courses. There are also plans for them to work with the CBC Northern Service once they have completed their institutional training.

#### CHFC Fort Churchill

Recovery from the extensive fire damage to the CHFC studios and offices in October, 1972, has been slow. Despite it though, station staff have presented a full well-balanced schedule of programs throughout

the past year. Greater emphasis has been placed on programming to serve the native people of the Keewatin — Eskimo Point, Whale Cove, Baker Lake and Rankin Inlet; and the communities of Sanikiluaq and Cross Lake.

*The A.M. Show* — provides a lively, entertaining format with music, news and sports taken from CBW Winnipeg's Information Radio, along with local Churchill news, weather and community announcements, humour, the short devotional program insert "Thought for the Day", short phone-out interviews and three inserts per morning in the Inuktitut language giving capsules of transportation information, weather and news aimed specifically at residents of Eskimo Point.

*Radio Noon* — lasts from 1200 to 1400 with information for the worker on his lunch hour; the *Tradeo* program, the marketplace of the air, where you can try to trade off your skidoo against someone's record player and tv set; information and entertainment for the housewife; studio guests discussing topics on the minds of Churchill women, and music to relax to.

*Around Town* — provides an incisive look at local happenings and other things concerning Churchill and the North. The whole program is based on the local newscast. If a topic in the news is of particular concern, its gone into in depth in this program. Regional news from Winnipeg and Yellowknife is presented plus a sports wrap-up. Some features are translated into all the local native languages for the program. News items which could be of interest to other centres as well as community announcements are broadcast as part of a news exchange system.

*Churchill News Week* — is a 15-minute weekly capsule of what has happened on the local scene during the week.

*Native Language Programs* — These are detailed in the schedule on page 00. There are daily Chipewyan and Inuktitut programs providing information and entertainment. The Chipewyan program provides a communications link between the people of Churchill and those living at Tadoule Lake, 150 miles away. There are pre-recorded messages, music and story telling. Although there is no regular transportation system, the station tries to obtain reciprocal messages from Tadoule Lake whenever anyone who can take a tape-recorder goes there.

There are many things which happen in Churchill of especial interest to the residents of Eskimo Point. The daily Inuktitut

program includes messages from people in the hospital and transient centre, interviews with people passing through, and any other news of interest.

The material gathered for the daily Cree-language program comes from trips to visit the people living along the railway line between Churchill and Gillam as well as interviews, messages, stories, news and community announcements collected by the host of the program.

When they are available, programs by the staffs of the Native Communications Incorporated of Thompson, Manitoba; Arviqpaluk, the Eskimo Point Radio Society; Sanikiluaq Radio Station; CKQN, the Radio Station at Baker Lake; and CBQR the Radio Station at Rankin Inlet, are broadcast over CHFC Fort Churchill. Also when available, news and messages to and from Cross Lake and from Whale Cove is aired.

*Music Programs* — *The Progressive Rock Show* has music which does not always fit in on other musical programs and as there are local people who like it and have extensive collections of records, they are invited to appear on the program to talk about their kind of music. *Sounds of Today* is a disc-jockey record program of rock music. Local popularity is used as a criterion for choice rather than any special position of any song on the hit charts. *Pop n' Country* is a Saturday afternoon program used as background music for whatever listeners happen to be out and about. Only the finest popular and country and western music is played, and the phone lines into the station are open for requests and dedications. *Chart Busters* is a fast-paced record show of hit parade music.

*Kid's Program* — is a program of children's songs and stories, *Ookpik*, *The Arctic Owl* wound up its long series on this program as a regular feature. There are also readings from selected children's books.

*Hockey Night in Churchill* — was reinstated after a year's absence due to the fire at CHFC in October 1972. The games were broadcast live in their entirety from the Hockey Arena every Thursday during the winter.

*Bad Weather* — CHFC has an excellent record of being able to operate normally except for an hour or two here and there, even though 50 mph winds may close all the schools and cause frequent power failures.

*Special Programs and Events Coverage* — A series of programs on the gradual closing

down of Fort Churchill and the redevelopment of the town of Churchill from the federal side. Included in this series was an extremely informative interview with Ron Harding of the Department of Public Works. CBC National Television telecast the National Film Board feature "Some Native of Churchill" during its WEST Series. The film proved to be a hot issue when discussed on an open-line show over CHFC. The Executive Director of the Film Board and member of the Manitoba Métis Federation were interviewed; later, the Human Rights Commission arrived to investigate. An English-language news report was obtained from Eskimo Point about the trial there on illegal polar bear hunting. Dr. Ralph Nicholson, project scientist, was interviewed about the first major rocket launch of the Aurora season from the Churchill Rocket Research Range. The rocket's mission was to gather data on the aurora and the ionosphere. A special open-line program was held with Dr. Nils Oritsland of the University of Guelph about polar bear research being done locally. Brian Ball, CHFC's technician, accompanied Joe Kwong from CBC Engineering Headquarters, to Rankin Inlet in October, to install the television transmitter for service via the communications satellite. The television service went officially on-air on October 24th with good picture quality. Other visits have been made by the technician and Bruce Taylor, CHFC manager, to Rankin, Eskimo Point or Baker Lake to aid them in their communications. With assistance from Alan Martin of the Directorate in Ottawa, Rankin Inlet Radio Station went on-air in May, and Sanikiluaq Radio Station went on-air during the Winter. A Great Plains Project Arctic Corridor Conference was held in Churchill during which a daily half-hour report was prepared and broadcast with excerpts from the conference and interviews with the people involved. The highlight of Churchill's Aurora Snow Festival was Anne Murray's fine concert performances which played to two packed houses. She was accompanied by John Alan Cameron and they both gave interviews for broadcast. The show also travelled to Yellowknife, Inuvik and Whitehorse where the performers gave equally well-received concerts.

CHFC featured a special open-line program in late May to ask local people to phone in with any questions they might have about television via satellite, and to state their preference for receiving programming on Atlantic time release or Pacific. The



program was called off after an hour and ten minutes when 56 people wanted the Atlantic and 55 wanted the Pacific. In addition, a regular ballot form was used in the local newspaper and in the local stores to try to measure public preference. This ballot resulted in 159 for Atlantic and 105 for Pacific.

**Training Program** — Donna Pace of the Federal Department of Communications arrived in Churchill to observe the CHFC operation and to learn how to use the basic equipment. She then produced a program about community radio. Later, she left to set up a community radio station in Big Lake. Harriet Muskego and Roy Smith from Cross Lake also came to CHFC to undergo about ten days of training. The Cross Lake Radio Station began broadcasting in July with most of its programming prepared by these persons.

#### CFFB Frobisher Bay

**Bright and Early** — was hosted in English and Inuktitut by Peter Miller and Jonathan. The CFFB Territorial News was broadcast in two editions in each language daily — first at 0740 and second at 1220 during the noon show. Together with news, information and music, there was also an Inuktitut language spot where one announcer/operator taught the other some basic points of his language. Later in the year, the program name was changed to *Adilik* and became based on the Information Radio morning program format which the English Services stations in the South have developed. CFFB retained the same goals as before: to concentrate the station's information content efforts into the morning block; to provide a constant source of information to listeners who are dependent upon newscasts, and to appeal to an awakening audience that also desires music, time, temperature and weather.

**Noon Notebook** — This program offers music and community announcements for use at home during the noon hour. It also includes news, weather and sports in French on the CBC French network.

**Kebec Partout** — music through recordings with a French-speaking host.

**Open-Line Show** — CFFB's open-line show began with broadcasts Mondays, Wednesdays and Fridays. The first show was on the topic of television via satellite in Frobisher Bay with the CFFB Station Manager Pat Reilly as guest. There was a strong response with callers commenting on the lack of late movies; ideas for

local programs and questions about when other channels would be available. Other actively discussed topics were Territorial Councillor Bryan Pearson's suggested alternative to drunk tanks in the North, and his idea, presented to the June N.W.T. Council Session, that hunters in the Territories should return to the use of dog teams and cease use of snowmobiles because of the latter's higher cost, frequency of breakdown and possible cause of increasing deafness to snowmobile riders. Callers into the program's host suggested that Mr. Pearson should check such ideas with hunters and others before presenting them to Council.

**Experiments** — The program "Sterilization of Native Women" from the CBC national television series *Weekend*, was telecast in Frobisher Bay with simultaneous voice transmission in English and Inuktitut. The program provided important information as well as being a valuable local experiment in bilingual (English-Inuktitut) television. As usual with Inuktitut programs in Frobisher Bay, there were not a large number of reactions to the program, either by phone or mail. However, the majority of comments which were received said this was not the most ideal method of presenting bilingual television, as the interference of the second language made it hard to concentrate on the other. All the callers were English except one Inuit caller who said that although he could understand his own language, he would have preferred that these translations run consecutively or that they be separated by media in a radio and tv simulcast of the audio portion. This method had been used previously but CFFB wanted to test the simultaneous method as it is often difficult to combine both radio and tv schedules for these special showings.

The *Weekend* program was followed by the showing of an Inuit Tapirisat of Canada production, entirely in Inuktitut, on the experiences of two Inuit students attending Algonquin College in Ottawa. There was little overt reaction to this production, but it was apparently appreciated by Inuit viewers.

Experimentation was made with an Inuit management trainee scheme. CFFB wanted to recruit a suitable Inuit announcer/operator for a long term program of extra training in administration/management work for a number of hours out of the regular announcer/operator work week. However there was no response to the public advertising nor through Inuit Tapirisat of Canada. The scheme is being rethought and planned

for later attempts to develop native CBC management in the North.

Development was made of a semi-automated community fire alarm announcement on radio, with CFFB being added to the main alarm system. When activated, a pre-recorded announcement is broadcast to the community and calls volunteers to the fire hall.

**Other Uses of the Satellite** — When CFFB began receiving television via the satellite in February, 1973, the station also began receiving the English national radio network on the second audio channel. In preparation for this, Pat Reilly and Joe Teemotie put together an English-Inuktitut booklet containing a complete program schedule and detailed descriptions of national, regional and local programs. Copies were run off and released to the Frobisher public.

The daily Inuktitut national news prepared by Elijah Menarik in Montreal was also fed to the second audio channel of the satellite, and later in the year, many other Inuktitut programs were fed to CFFB in this manner. Previously, they arrived via short-wave but always with the inherent inter-rutions of that medium.

With the arrival of the satellite, the telephone system improved. CFFB used it to supply Radio Station CHPI Pond Inlet with a feed of Inuktitut National and Territorial News.

**Special Programs and Events Coverage** — CFFB covered and reported upon the Eastern Arctic Teachers' Conference for local, territorial and national radio news. The Conference was attended by, amongst others, Farley Mowat, Jack McClell and Keith Crowe. A special open-line program was made about the HOUSING CRISIS IN FROBISHER BAY together with a production of a documentary about the housing made on half-inch videotape and telecast over CFFB-TV just before the open-line program started on radio. The audio of the open-line was simulcast on tv as was the sound of the tv documentary on radio. CFFB technician Len Whyte went at the request of the local people to help instal some new radio equipment at CHPI Pond Inlet. This equipment provided reel to reel tape. Thereafter, CFFB and the Montreal Production Centre were able to mail Inuktitut programs to CHPI as well as to telephone them through. As a preview to Frobisher Bay's *Toonik Tyme Winter Carnival*, a fund-raising radio talent auction was held at the Canadian Legion Hall which CFFB broadcast live and "remote". Larry



Chapman and Aimo Nookiguak supervised CFFB's later coverage of the Carnival events with reports daily throughout the week as well as four hours of live coverage on the last day. Jonah Kelly and Pat Reilly journeyed into Arctic Quebec to Great Whale River and Povungnituk to give support to community broadcasting stations there. Efforts were also being made by staffer Diane Vogel to recruit stringers for contributions to the programs on CFFB in its capacity as CBC's eastern Arctic program centre.

#### Montreal Production Centre

The three most significant developments of the year for the Northern Service Montreal Production Centre were the increase in hours of the Northern Shortwave Service from 8 1/2 to 19 hours daily; production of a news and information television program in Inuktitut, *Tarqavut*, and its counterpart *Our North* in English; and addition of nightly news in Cree on shortwave, see the shortwave schedule appended on pages 26-33.

The Montreal Production Centre continued actively in regional and network productions with special projects over the year including, for the national radio network program series "Between Ourselves", the 60-minute programs *Mad Trapper of Rat River - The Chase For an Killing of Albert Johnson and Kluane, Lost Horizon of the Yukon - Is the Creation of This Park in the Yukon Desirable?*; and *Eastern Arctic Patrol by the RCMP*. Also for the national network, a Christmas Special - *A Northern Variety Pack*.

Other special programs were the RCMP Centennial program series *Recollections of the Royal Mounted Police* (which was later made into 13 quarter-hour episodes on disc and distributed by Radio-Canada International); a 30-minute documentary on the return to Canada from Germany of the Speyer Collection, described as the most complete collection of Indian artifacts known to have been in private hands; a 30-minute documentary on cold weather testing carried out at the Institute of Environmental Medicine; a 30-minute documentary of research into the effects of man living deep under the Arctic Ocean, also carried out at the Institute; a 30-minute special on the Mackenzie Pipeline with material collected at the Royal Society Symposium on Energy; and a 30-minute special on *The Search for John Franklin* from a Radio-Canada International transcription disc.

There were many contributions about the North to the national radio network, amongst which were - for "Five Nights a Week at this Time", an item on the opening of the arctic shipping season with emphasis on the new and higher rates; a Mackenzie Pipeline special on the occasion of Arctic Gas applying to the National Energy Board; *Is the Yukon Ready for Provincehood?*; and the alcohol problem, North of 60°. Nine 60-minute programs were made for "Holiday" and broadcast during the Summer, and *North by Sea*, a series of thirteen 15-minute programs, was updated with an additional 15-minute program on 1973 activities in the Polar Seas. The entire series was re-run on the national network radio schools broadcasts.

*Okkpiik, The Arctic Owl* has been one of the longest produced series in the history of the Montreal Production Centre. It was broadcast on shortwave and over the northern CBC stations as well as being made available on Radio-Canada International transcription disc. The series finally came to its well earned rest during the 1973/74 season.

*Rebound*, a 60-minute show was produced for the network looking at sporting activities and community participation North of 60°. Montreal also produced a two-part series on the *Life and Times of Robert Service* for the national network series "The Bush and the Salon". This series is also heard on northern shortwave and this particular program on Robert Service was also recorded as an RCI transcription.

First there were the comic books and then the Northern Service got in on the act of *Captain Al Cohol* by producing thirty-nine three to six-minute cliffhanger-style "dramettes" for northern listeners.

To achieve background material for its many programs, the Montreal Production Centre has often called upon staff at the northern stations for assistance so that its programs are truly regional. Conferences held in the South but of northern interest and consequence, are attended for or their broadcast material. These included the Northern Resources Conference (Edmonton), the Royal Symposium on Energy Resources (Ottawa), the National Conference on Tourism (Toronto), the Canadian Mining Exhibition (Toronto) and the Man and Resources Conference (Toronto).

The Montreal Production Centre's coup of the year was for its producer Les McLaughlin to be selected as recipient of the 1974 Imperial Relations Trust Bursary. This

gives Mr. McLaughlin the opportunity to spend six months in Great Britain, meeting with various representatives of industry, government and broadcasting in all of its expressions. He intends to study both radio and television while there. In his absence, the Centre's activities in English-language production will be covered by selected members of staff from the northern station in residence in Montreal for different periods.

#### General

*Arctic Winter Games* - Thirteen Northern Service representatives, from Frobisher Bay, Fort Churchill, Inuvik, Yellowknife, Whitehorse and Ottawa, made up the broadcast team covering the Third Arctic Winter Games in Anchorage, Alaska. This team produced ninety-three reports on feeds in English and Inuktitut, as well as complete coverage of all hockey games.

Program material was packaged at the Games Production Centre in Anchorage and fed via a voice-grade circuit to master control in Whitehorse where it was recorded and released via broadband to Inuvik and Yellowknife and to radio master control in Montreal and Vancouver. Yellowknife fed the material on wards via telephone to Frobisher and Churchill. Montreal fed the material on to the television Network Control Centre in Toronto and to the Northern Shortwave Service. The N.C.C. feed went to Frobisher Bay and Churchill on Channels "B" (eastern) and "C" (western). This was the first time the audio channels of the satellite had been used for program distribution of material from a Northern Service "remote" operation. In addition all CBC newsrooms and all Northern Service stations received a continuous flow of telexed information for use in checking and in expanded program material. This telex service was due to the expertise of Wally Blaney, Supervising Teleprinter from the Concentre in CBC's Head Office, Ottawa, who joined the Northern Service for the Games coverage in Anchorage. Telex had never before played such a key role in reporting results on a CBC outside broadcast of this nature.

*Charlie Panigoniak* - is a 26-year old musician from Eskimo Point (200 miles north of Churchill, Manitoba), who was launched on his musical career after his father made him his first guitar from an old metal milk jug. Charlie, also renowned as a carver in stone, ivory and bone, never writes his songs down but prefers to make them up

and change them to suit the occasion. CBC English Services Division's Community Radio Office made up two 45 rpm recordings of Charlie's songs and music, which the Northern Service is distributing for \$2.00 per set of two records. The first one thousand records sold very quickly and an additional one thousand, recently received are also rapidly disappearing. Little promotion has had to be done; news usually carries quickly in the North and the orders have been pouring in.

**Recruitment** — Broadcaster and film producer Bob Charlie has been assigned to evaluate the recruitment policy of the Northern Service with respect to hiring Indian, Inuit and Métis people, and to prepare an inventory of potential candidates for employment generally with the CBC. Born in Whitehorse, Bob Charlie joined CBC here in 1965 and moved in 1971 to Montreal to take a two-year course in cinematography at the National Film Board. He plans to produce a video documentary on the activities of CBC stations in the North and the living conditions and surroundings in those communities to give the public a better idea of the CBC Northern Service.

**Shortwave** — When the Northern Shortwave Service expanded its hours of programs and acquired a directional antenna of its own with increased transmitter power, a newly designed QSL card was made available to mark these developments. It will be mailed to listeners who provide the Service with information about details of program content, date and time to reception and frequency or wavelength listened to.

The northern stations, program centres, and the Montreal Production Centre, are well served by their multilingual staffs. A recent schedule of programs broadcast on shortwave and mediumwave radio in the northern languages appears on pages 26–33.

## Program and Activities Plans for 1974-75

### FWH Whitehorse

**Radio Noon** will be enlivened by remote transmissions from communities served by FWH as well as in the city.

### FYK Yellowknife

**More Than Music** will be originated at least once a month from the many communities served by the Mackenzie Network. Production of a new public affairs program covering the entire North, with contributions from all Northern Service stations.

### CHAK Inuvik

Continuation of the students' training project, jointly financed by CBC and the N.W.T. Government.

Publication in English and possibly in Loucheux and Inuktitut of some of the *Stories and Legends* being amassed by Louie Goose from Delta sources for CHAK Inuvik.

### CHFC Fort Churchill

Greater encouragement of community stations at Sanikiluaq, Whale Cove, Baker Lake, Rankin Inlet and Eskimo Point to supply regular information and entertainment programs to CHFC for local broadcast and possibly also on northern shortwave.

Extension of the *Kids' Program* by readings in serial form so that many more books could be made known to young listeners.

Production of a program, *Our Community* which would tell the people of Churchill more about the nature cultures which make up "our community". Stories and legends in English from the Cree, Chipewyan and Inuit cultures would give insight; also, as an occasional feature, mini-lessons in the various languages. Both traditional and modern music would be used for bridging.

*Children's Drama* through the local schools. These one-hour radio dramas would be produced; it is hoped that one of these will be an original composition. The other two would enhance part of the required reading in the English program at the school.

**Insight** — an information/public affairs program about matters of the day. Flexible enough to change from magazine presentation to an open-line technique with guests in the studio. Topics will range from a discussion of the sewage problems in Eskimo Point to why polar bears don't get cold feet.

### CFFB Frobisher Bay

Increase in local French-language programming, such as extending *Kebec Now* to include more than music — information and news from Quebec. This is a weekday program. Plans are to add a Saturday program of similar format entitled *Autour du Village*.

Increase recording of northern musical artists on tape, and use in programs in the same way as records are now used. Investigate the copyright information for these artists.

Production of two phone-in shows, one in English and the other in Inuktitut with

topics for discussion from the institutional areas of health, government, economics, Hamlet Council, education and the law, to sharing opinions and ideas about various issues and problems.

**On Second Thought** — an alternative to live coverage of the Sunday church service which used to be CFFB's only religious program. This newly proposed program would be a talk show where various people in the community associated with religions(s) or moral viewpoints by vocation or personal concern would be assembled as a panel. A moderator would question each one about his moral viewpoint on a social, political and/or economic concern of local life, such as drugs, government, legal system, housing, family planning and so on. The panel would not necessarily be made up of the same people each week; its composition would depend upon the topic.

### Montreal Production Centre

Resumption of *Inuit Speak Their Minds*, a bi-weekly publication of excerpts from Eskimo-language programs produced in Montreal, Frobisher and Churchill. Translations from Inuktitut into English of expressed ideas, opinions, plans and meetings of the Inuit which will be distributed to teachers, social workers, government and other broadcasters.

A special daily *Family Drama Series* based on northern living conditions. Experimental program projects have already been carried out successfully at Povungnituk and Yellowknife in Inuktitut and Slavey.

**This is the Law** — Three-to-five minute dramatized events depicting various situations in which people find themselves in conflict with the law. The program would attempt to show what the individual's rights are and how he or she can deal with the problem.

**Do You Know Your North?** a quiz show with moderator and panel of four including a weekly guest who is noted for his or her northern words or deeds. The intent would be to ask questions of the panel dealing with history, geography, famous people, sounds, music, culture and resources. The guest would be quizzed on attitudes about the North. The home audience would be encouraged to play along. For example, questions could be printed in northern newspapers with a special question which could only be answered the following week. The program might also be taped in front of a live studio audience.



*Emouqyauij*, a daily half-hour program in eastern Cree exploring ideas and events in the northern Indian communities. The program will also inform the Cree people of meetings, associations, council activities, home economics and social development of various kinds. The program's main purpose will be to develop Cree broadcasting to meet the requirements of an audience linguistically isolated and accessible only by short-wave.

*Ishuvamut*, a daily, weekday phone-in show at noon hour when calls are welcomed from anywhere in the North to talk about topics of interest to everyone or just to select a piece of popular music to be played.

#### General

Goals for the Northern Television Service:

The establishment of a television film operation in the North which would

provide a northern source of tv program material for inclusion in existing network programs as well as for inclusion in the planned Northern Evening Information Program. This would create a direct involvement of northern people in the Northern Television Service and also build interest in television technology and production which would aid the future recruitment of staff.

Lacking the resources to produce programs for northern television, the Northern Service must rely entirely on the limited supply of existing suitable programs. The Northern Television Service will increase research, screening and cataloguing and will be required to make arrangements for dubbing of some material from film to videotape outside the CBC.

An aim of the Northern Television Service is to provide the people of the North with current weather information via *Anik*. Four 57-second programs, two to each channel ("B" and "C") would be placed during identification periods at approximately 2030 and 2330 Eastern time. At those times, two separate but simultaneous audio reports would be transmitted on the respective channels as a common weather slide is shown on both. The Public Weather Services, Toronto, and the Edmonton Weather Office have confirmed their cooperation in compiling and feeding weather reports specifically for transmission on the Northern Television Service.

#### NORTHERN SERVICE — Radio

Comparison in growth over two years of native-language programs and English-language programs made by, and for, native people and broadcast on the Northern Shortwave Service and on the five northern A.M. radio stations situated in Inuvik, Northwest Territories, Frobisher Bay, Northwest Territories, Yellowknife, Northwest Territories, Fort Churchill, Manitoba, and Whitehorse, Yukon Territory. (Figures given are weekly).

**ORIGINAL** refers to any program which is made at that station or any program which is especially made for that station, but made somewhere else.

**REPEATS** refer to any program, made locally and broadcast more than once, as well as to programs made elsewhere, broadcast there and sent on to a Northern Service station or to the Northern Shortwave Service for their broadcast use.

#### SHORTWAVE Montreal Production Centre

March, 1972	Total program hours broadcast weekly	59 hours 30 min.
	Original Eastern Inuktitut	5 hours 20 min.
	Repeats Eastern Inuktitut	5 hours
	Original English	30 min.
February, 1974	Total program hours broadcast weekly	133 hours
	Original Eastern Inuktitut	7 hours 35 min.
	Repeats Eastern Inuktitut	6 hours 35 min.
	Original Keewatin Inuktitut	30 min.
	Original Eastern Cree	1 hour 20 min.
	Repeats Eastern Cree	55 min.
	Repeats English	1 hour 15 min.

#### A.M. RADIO CFFB, Frobisher Bay, Northwest Territories

March, 1972	Total program hours broadcast weekly	132 hours
	Original Eastern Inuktitut	18 hours 45 min.
	Repeats Eastern Inuktitut	6 hours 30 min.
February, 1974	Total program hours broadcast weekly	133 hours
	Original Eastern Inuktitut	27 hours 31 min.
	Repeats Eastern Inuktitut	5 hours 35 min.
	Original English	29 min.
	Repeats English	1 hour

**CFYK, Yellowknife, Northwest Territories**

March, 1972	Total program hours broadcast weekly	<i>132 hours</i>
	Original Chipewyan	1 hour
	Original Dogrib	1 hour
	Original Slavey	30 min.
	Original English	2 hours
	Repeats Eastern Cree	30 min.
	Repeats English	1 hour

February, 1974	Total program hours broadcast weekly	<i>133 hours</i>
	Original Chipewyan	2 hours 35 min.
	Original Dogrib	2 hours 35 min.
	Original Slavey	30 min.
	Original English	6 hours 25 min.
	Repeats English	1 hour
	Repeats Eastern Cree	30 min.
	Repeats Hareskin	30 min.

**CHFC, Fort Churchill, Manitoba**

March, 1972	Total program hours broadcast weekly	<i>132 hours</i>
	Original Keewatin Inuktitut	1 hour
	Original Chipewyan	2 hours 30 min.
	Original English	30 min.
	Repeats English	1 hour
	Original Cree	30 min.
	Repeats Eastern Inuktitut	3 hours

February, 1974	Total program hours broadcast weekly	<i>133 hours</i>
	Original Keewatin Inuktitut	4 hours 15 min.
	Original Chipewyan	2 hours 30 min.
	Original Manitoba Cree	2 hours 45 min.
	Original English	15 min.
	Repeats English	1 hour
	Repeats Eastern Inuktitut	1 hour 20 min.

**CHAK, Inuvik, Northwest Territories**

March, 1972	Total program hours broadcast weekly	<i>132 hours</i>
	Original Western Inuktitut	4 hours 10 min.
	Repeats Western Inuktitut	7 min.
	Original Loucheux	3 hours 41 min.
	Repeats Loucheux	8 min.
	Original Hareskin	7 min.
	Original English	2 hours 17 min.
	Repeats English	1 hour

February, 1974	Total program hours broadcast weekly	<i>133 hours</i>
	Original Western Inuktitut	3 hours
	Repeats Western Inuktitut	15 min.
	Original Loucheux	4 hours 25 min.
	Repeats Loucheux	10 min.
	Original Hareskin	30 min.
	Original English	21 hours 15 min.
	Repeats English	1 hour

**CFWH, Whitehorse, Yukon Territory**

March 1972	Total program hours broadcast weekly	<i>132 hours</i>
	Original English	2 hours 30 min.
	Repeats English	1 hour 30 min.

February, 1974	Total program hours broadcast weekly	133 hours
	Original English	6 hours
	Repeats English	1 hour

# PROGRAMS MADE BY AND FOR THE NATIVE PEOPLES AND BROADCAST ON THE NORTHERN SERVICE:

## SHORTWAVE SERVICE — Programs broadcast by the Montreal Production Centre

Times Weekly	Programs
	<i>Nallachine</i> (Eastern Inuktitut) Mondays through Saturdays, 2030 — 2100, (repeat at 1100 — 1130 except Saturdays). Produced by Elijah Menarik and Aimo Nookiguak. The Monday to Friday program is produced in Montreal, the contents both informational and musical. Personal messages are featured when received from Inuit patients in southern hospitals and students attending "outside" schools. The Saturday edition originates in Ottawa, with Mary Otis, freelancer, as host.
5 hours 30 min.	<i>Ishuvimut</i> (Eastern Inuktitut) Mondays through Fridays, 1230 — 1300. Produced and hosted by Aimo Nookiguak. Program features news, weather reports, phone-out and phone-in, music and feature reports of interest to the audience.
2 hours 30 min.	<i>National News</i> (Eastern Inuktitut) Mondays through Fridays, 1745 — 1800, (repeat at 2130 — 2145). Produced by staffers Elijah Menarik and Aimo Nookiguak.
2 hours 30 min.	<i>Cree News</i> (Eastern Cree) Mondays through Fridays, 1755 — 1800 and 1820 — 1825, (1820 — 1825 repeated at 2145 — 2150). Produced by freelancers, Ethyl Blackned and Edna Voyageur.
1 hour 15 min.	<i>Ikaluit Uquasi</i> (Eastern Inuktitut) Frobisher Calling Mondays, 2003 — 2030. Produced in Frobisher Bay by staffer Jonah Kelly. The program serves traditional cultural interest, features interviews about the old way of life, the history of the Inuit and legends, stories and folk music gathered in settlements and communities throughout the Arctic.
30 min.	<i>Territorial News Roundup</i> (Keewatin Inuktitut) Tuesdays, 2000 — 2030. Produced by Betty Brewster, a freelancer for CFYK, Yellowknife.
30 min.	<i>Kannatap Inuit Nunn Angat</i> (Eastern Inuktitut) Canada North of 60 Wednesdays, 2003 — 2030. Produced by Jonah Kelly for CFFB. A news-magazine program which provides in-depth summaries of recent happenings. The program regularly includes Co-op News, aspects of settlement council sessions and editorial contributions about the North.
30 min.	<i>Teterkat</i> (Eastern Inuktitut) Thursdays, 2003 — 2030. Produced by Seemee Nookiguak for CFFB Frobisher Bay, on staff.
30 min.	<i>Neejawtit Ikaluinee</i> (Eastern Inuktitut) Fridays, 2003 — 2030. Produced by Seemee Nookiguak for CFFB Frobisher Bay. A music program with a hard rock sound.
15 min.	<i>Delta News</i> (English) Saturdays, 0730. A report in English fed from CHAK, Inuvik as part of the Northern Morning Show. The program gives news of people, events and developments in the settlements on the Mackenzie Delta.
1 hour	<i>National News Roundup</i> (Eastern Inuktitut) Saturdays, 1100 — 1130, (repeat at 1730 — 1800). Produced by Elijah Menarik and Aimo Nookiguak.
1 hour	<i>Our Native Land</i> (English) Saturdays, 1205 — 1300. The only network radio program presenting the views of Canada's native people through its host, Johnny Yesno.
30 min.	<i>Cree Magazine</i> (Eastern Cree) Saturdays, 2100 — 2130. Produced by freelancer Ethyl Balckned. Program includes reports on the condition of Cree patients hospitalized in Montreal and Quebec City, music and translation of news-paper features of interest to Cree listeners.

*Tarqumuit* (Eastern Inuktitut)

0 min. Sundays, 1110 — 1130, (repeat at 1740 — 1800). Produced by Elijah Menarik and Aimo Nookiguak.

**TELEVISION SERVICE — Programs produced by the Montreal Production Centre***Tarqavut* (Eastern Inuktitut)

min. Saturdays, following National News at 2300. Produced by Marie Tessier-Levigne, with Elijah Menarik and Aimo Nookiguak as hosts. An information program produced for the special interest of the native people of the Eastern Arctic.

*Our North* (English)

min. Saturdays, following National News at 2300. Produced by Marie Tessier-Levigne, with Elijah Menarik and Aimo Nookiguak as hosts. An information program produced for the special interest of the native people in the Northwest.

**RADIO STATION CFFB FROBISHER BAY, NORTHWEST TERRITORIES****Times Weekly Programs***Kudlik* Information Morning (Eastern Inuktitut)

5 min. Mondays through Fridays, 0600 — 0900. An English-language program with items of interest to Unuit community interspersed throughout. (producer varies with announcer/operator on shift).

*News* (Eastern Inuktitut)

hour 15 min. Mondays through Fridays, 0600 — 0900. Three 5 minute newscasts are given during the program *Kudlik*, (producer varies)

*Nallachine* Things to Listen to (Eastern Inuktitut)

hours 30 min. Mondays through Fridays, 1130 — 1340. The program is produced in Montreal by Elijah Menarik and Aimo Nookiguak, the contents both informational and musical.

*Quiruleet* (Eastern Inuktitut)

hours Mondays through Fridays, 1610 — 1700. The first half of the show is devoted to country and western music and the second half to the rock sound. (Inuit students each produce a show).

*National News* (Eastern Inuktitut)

hour 15 min. Mondays through Fridays, 1830 — 1845. Produced in Montreal by Elijah Menarik and Aimo Nookiguak.

*Territorial Eastern Arctic News* (Eastern Inuktitut)

0 min. Mondays through Fridays, 1840 — 1850. The news is gathered from eastern Arctic settlements, from the CBC's newsroom in Yellowknife and from news reports in Ottawa. (producer varies)

*Neejawatit Ikaluine* (Eastern Inuktitut) Hit Parade.

0 min. Mondays, 1403 — 1430. Produced by Seemee Nookiguak for CFFB Frobisher Bay. A music program of contemporary sound.

*Ikaluit Uquasi* (Eastern Inuktitut) Frobisher Calling

0 min. Tuesdays, 1403 — 1430. Produced by Jonah Kelly for CFFB Frobisher Bay. The program serves traditional cultural interests, features current affairs, interviews about the old way of life, the history of the Inuit and legends, stories and folk music gathered in settlements and communities throughout the Arctic.

*Kannatap Inuit Nunn Angat* Canada North of 60 (Eastern Inuktitut)

0 min. Wednesdays, 1403 — 1430. Produced by Jonah Kelly for CFFB Frobisher Bay. A news-magazine program which provides in-depth summaries of recent happenings. The program regularly includes Co-op News, aspects of settlement council sessions and editorial contributions about the North.

*Celina's Program* (Keewatin Inuktitut)

0 min. Fridays, 1403 — 1430. Produced by Celina Issakiauk (on staff) Fort Churchill, for CHFC.

*Teterkat Inoonoot* Messages (Eastern Inuktitut)

0 min. Fridays, 1403 — 1430. Produced by Seemee Nookiguak. Light music of current interest and messages as and when received from Inuit patients and students "outside" to their relatives and friends in the North. Also messages between persons at isolated communities through the Arctic.

*Open-Line Show* (Eastern Inuktitut)

hour Saturdays, 0905 — 1000. (Producer varies)



1 hour	<i>Our Native Land</i> (English) Saturdays, 1205 – 1300. The only network radio program presenting the views of Canada's native peoples through its host, Johnny Yesno.
1 hour	<i>National News Roundup</i> (Eastern Inuktitut) Saturdays, 1303 – 1333 and Sundays, 1503 – 1533. Produced in Montreal by Elijah Menarik and Aimo Nookiguak and fed to CFFB via Anik satellite.
20 min.	<i>Tarkamuit</i> (Eastern Inuktitut) Saturdays, 1333 – 1353. Produced in Montreal by Elijah Menarik and Aimo Nookiguak and fed to the CFFB via Anik satellite.
3 hours	<i>Baffin Beat</i> (Eastern Inuktitut & English) Saturdays, 2210 – 0100. The music is directed to the Inuit with local Inuit talent participating live or pre-recorded. The show is interrupted at 2300 for 3 minutes of news in English and again at 2400 for 13 minutes of news in English. Producer varies with announcer/operator on shift.
30 min.	<i>Sunday Afternoon</i> (Eastern Inuktitut) Sundays, 1533 – 1600. A music show. Producer varies with announcer/operator on shift.
2 hours	<i>Driftin'</i> (Eastern Inuktitut & English) Sundays, 2303 – 0100. A music show interrupted by Northern news in English for 13 minutes at 2400. Producer varies with announcer/operator on shift.
12 hours	There are an additional 12 hours per week of Inuktitut content on other types of programs which may be basically English-language programs but contain Eastern Inuktitut inserts.

#### RADIO STATION CFYK YELLOWKNIFE, NORTHWEST TERRITORIES

Times Weekly	Programs
2 hours 5 min.	<i>Community Announcements</i> (English) Mondays through Fridays, 1240 – 1255 and 1715 – 1725. Program includes community announcements of interest to the Mackenzie Network's native listeners. Producer varies with the announcer/operator on shift.
2 hours 30 min.	<i>The Native Voice</i> (Chipewyan & Dogrib) Mondays through Fridays, 2230 – 2300. A program of information and music in Chipewyan and Dogrib produced and hosted by Joe Toby. Also Ted Trindell makes regular contributions in Slavey from Fort Simpson.
1 hour 30 min.	<i>Public Affairs</i> (Chipewyan, Dogrib & Slavey) Mondays, Wednesdays & Fridays, 1930 – 2000. Coverage of public affairs in native languages, such as 51st session of N.W.T. Council. Produced by Joe Toby (on staff) and Ted Trindell (freelancer).
1 hour	<i>Our Native Land</i> (English) Saturdays, 1310 – 1400. The only network radio program presenting the views of Canada's native people through its host, Johnny Yesno.
2 hours	<i>Gather Round</i> (English) Saturdays, 1403 – 1600. A program of country and western requests received from local native people. Producer George Tuccaro (on staff).
1 hour 30 min.	<i>Mackenzie Charger</i> (English) Saturdays, 1603 – 1730. A review of the latest pop sounds combined with the latest territorial sports news. Hosted and produced by Maurice Chobotar.
30 min.	<i>Square Dance Notebook</i> (English) Saturdays, 1730 – 1800. A program of lively toe-tapping sounds. Host and producer Bob Fyfe, (freelancer).
30 min.	<i>Alberta Native Communications Society Program</i> (Alberta Cree) Saturdays, 1830 – 1900. A program with information about the native of Alberta. Produced by Barbara Angus for the Alberta Native Communications Society.
30 min.	<i>News and Public Affairs</i> (Hareskin) Saturdays, 1900 – 1930. Produced by freelancer Mary Wilson.
1 hour	<i>Country and Western Show</i> Saturdays, 2100 – 2200. Record show produced and hosted by Joe Tobie in Dogrib, Chipewyan and some English, featuring selections requested by the native peoples.

*Eskimo Territorial News* (Keewatin Inuktitut)

Program *not broadcast locally* but sent by broadband to the Montreal Production Centre for short-wave broadcast to the North. Produced by freelancer Bill Tagoona.

**RADIO STATION CHFC, FORT CHURCHILL, MANITOBA**

Times Weekly	Programs
5 min.	<i>Morning Show</i> (Keewatin Inuktitut) Mondays through Fridays, 0800 – 0900. Three three-minute inserts by Celina Issakiauk (on staff) during the morning show.
hours 30 min.	<i>Chipewyan Program</i> (Chipewyan) Mondays through Fridays, 1403 – 1430. This program includes messages to residents of Tadoule Lake 140 miles west of Churchill, stories, legends, local news and music. Produced by a casual staffer at CHFC.
hours 30 min.	<i>Celina's Program</i> (Keewatin Inuktitut) Mondays through Fridays, Mondays, Tuesdays & Fridays at 1638 – 1700, Wednesdays at 1608 – 1700, and Thursdays at 1628 – 1700. The program includes messages, local news, plane departures and schedules. Produced by Celina Issakiauk on staff at CHFC.
hours 30 min.	<i>The Cree Program</i> (Manitoba Cree) Mondays and Fridays, 1608 – 1638. The program contains local news and announcements, some interviews, stories and music. Produced by a casual staffer at CHFC.
0 min.	<i>Nallachine</i> (Eastern Inuktitut) Things to Listen To. Mondays and Fridays, 1608 – 1638. The contents of this program are both informational and musical. Produced in Montreal by Elijah Menarik and Aimo Nookiguak.
0 min.	<i>Ikaluit Uquasi</i> Frobisher Calling (Eastern Inuktitut) Tuesdays, 1608 – 1638. The program serves traditional cultural interests, features interviews about the old way of life, the history of the Inuit and legends, stories and folk music gathered in settlements and communities throughout the Arctic. Produced by Jonah Kelly, on staff, CFFB Frobisher Bay.
0 min.	<i>Tarquamuit</i> (Eastern Inuktitut) Thursdays, 1608 – 1628. Produced by Elijah Menarik and Aimo Nookiguak in Montreal.
0 min.	<i>Eskimo Point Program</i> (Keewatin Inuktitut) Saturdays, 1103 – 1130. This program is aimed at the residents of Eskimo Point with things of interest and local music gathered in Eskimo Point. Produced by freelancers of the Eskimo Point Radio Society.
0 min.	<i>Rankin Inlet Program</i> (Keewatin Inuktitut) Saturdays, 1130 – 1200. The program contains interviews and topics of interest from Rankin Inlet. Produced by the staff of the Rankin Inlet community radio station.
hour	<i>Our Native Land</i> (English) Saturdays, 1205 – 1300. The only network radio program presenting the views of Canada's native peoples through its host, Johnny Yesno.
0 min.	<i>Native Communications Show</i> (Manitoba Cree & English) Saturdays, 1300 – 1330. This program contains anything affecting native and Metis peoples in Northern Manitoba. Produced by Native Communications Inc. of Thompson, Manitoba.

**RADIO STATION CHAK, INUVIK, NORTHWEST TERRITORIES**

Times Weekly	Programs
hours	<i>Community Billboard</i> (English) Mondays through Sundays, 1203 – 1300, 1845 – 1900, 2303 – 2315. A program of community announcements and messages. Producer varies with announcer/operator on shift.
0 min.	<i>Morning Show</i> (Inuktitut & Loucheux) Mondays through Fridays, 0600 – 0900 (repeat 2300 – 0100). This English-language program contains two native-language drop-ins of 2 – 3 minutes each, in either Inuktitut or Loucheux. Producer varies with announcer/operator on shift.

1 hour 15 min.	<i>Evening Report</i> (English) Mondays through Fridays, 1745 – 1800. Produced by Barry Burgess, on staff CHAK.
8 hours	<i>Country and Western</i> (English) Mondays through Thursdays, 1300 – 1400, 2403 – 0100. Country and western music programs are instituted because of the very keen interest and enjoyment the people of this region receive from them. Producer varies with announcer/operator on shift.
1 hour	<i>Public Affairs Program</i> (English, Inuktitut, & Loucheux) Mondays, Wednesdays and Fridays, 1903 – 1920, 1920 – 1940, 1940 – 2000. Occasional coverage is needed for events such as the 51st session of the Northwest Territorial Council. Translated and produced by Billie Day and Jim Koe, freelancers, CHAK.
1 hour	<i>Yea – Anow – DI A Long Time Ago</i> (Inuktitut & Loucheux) Tuesdays, 2230 – 2300, Thursdays 2230 – 2300. Legends and stories told in Inuktitut and Loucheux with an English translation. Produced by Louie Goose, on staff, CHAK.
1 hour	<i>Inuit Nipaitt A Native Voice</i> (Inuktitut & Loucheux) Wednesdays, 2230 – 2300, Fridays, 2230 – 2300. A program featuring news, public affairs and information. Inuktitut produced by Victor Allen and Loucheux produced by Jim Koe, both freelancers, CHAK.
30 min.	<i>News and Public Affairs</i> (Hareskin) Mondays, 2230 – 2300. Produced by Mary Wilson, on staff, CHAK.
1 hour	<i>Our Native Land</i> (English) Saturdays, 1210 – 1300. The only network radio program presenting the views of Canada's native peoples through its host, Johnny Yesno.
1 hour 30 min.	<i>Nughwha Kutchin Guhnduk The People Speak</i> (Loucheux & Inuktitut) Saturdays, 1400 – 1530. The program contains interviews and discussions of current affairs. Produced by CHAK staffers with freelance hostess Mary Tedde and contributions from freelancers Sam Raddi and Victor Allen. Program made in co-operation with the Committee of Original People's Entitlement.
1 hour 30 min.	<i>Tukudk Kindjik</i> (Loucheux Request Show) Saturdays, 1530 – 1700. A program containing light music requests, messages and announcements. Produced by CHAK staffers with freelance producer Jim Koe, hostess Lucy Moore and contributions from Susie Husky.
30 min.	<i>Trappers' Program</i> (English) Sundays, 1230 – 1300. The program supplies information directly related to trapping such as new methods and equipment, fur auctions and interviews with fur buyers and Delta District trappers. Produced by Ken Look, on staff, CHAK.

#### RADIO STATION CFWH, WHITEHORSE, YUKON TERRITORY

Times Weekly	Programs
2 hours 30 min.	<i>Northern Lights Storytime</i> (English) Mondays through Fridays, 1630 – 1700. This program features Indian legends and Indian songs. Produced by Sheila Bosely, on staff, CFWH.
30 min.	<i>Skookum Jim</i> (English) Wednesdays, 2000 – 2030. Produced by Sheila Bosely, staff, CFWH.
1 hour	<i>Yukon Native Voice</i> (English) Thursdays, 2030 – 2130. This program includes news and some music with native-language items where possible, (Tlingit and Tutchone). Produced by Lula Johns, on staff, CFWH.
1 hour	<i>Our Native Land</i> (English) Saturdays, 1210 – 1300. The only network radio program presenting the views of Canada's native peoples through its host, Johnny Yesno.
2 hours	<i>Klahowya</i> (English) Saturdays, 1500 – 1700. Mainly in English but distinctly for the Indian audience. Occasionally there may be inserts in <i>Tlingit</i> . Reports from community correspondents form and important part of this informational and musical program. Produced by Sheila Bosely, on staff, CFWH.

## CBC NORTHERN SHORTWAVE SERVICE / SERVICE ONDES COURTES DU NORD DE RADIO-CANADA

EST HNE ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ	MONDAY THROUGH FRIDAY LUNDI À VENDREDI ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ	SATURDAY SAMEDI ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ	SUNDAY DIMANCHE ΔΔΔ ΔΔΔ ΔΔΔ ΔΔΔ	EST HNE ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ	KHZ ΔΔΔΔΔ ΔΔΔΔΔ ΔΔΔΔΔ
0635	NORTHERN CANADA SHORTWAVE SERVICE SIGN-ON	NORTHERN CANADA SHORTWAVE SERVICE SIGN-ON	NORTHERN CANADA SHORTWAVE SERVICE SIGN-ON	0635	9625
0637	CBC NEWS AND SPORTS	CBC NEWS AND SPORTS	NHL HOCKEY HILITES	0637	5960
0648	RADIOJOURNAL ET CHRONIQUE SPORTIVE	RADIOJOURNAL ET CHRONIQUE SPORTIVE	CBC NEWS AND SPORTS	0648	
0700	THE WORLD AT SEVEN AND SPORTS HEAD- LINES	CBC NEWS AND SPORTS		0700	
0716	THE MORNING SHOW	THE MORNING SHOW	FOLK SOUNDS	0716	
0800	THE WORLD AT EIGHT	CBC NEWS AND SPORTS	CBC NEWS, WEATHER AND SPORTS	0800	
0810		TALKING SPORTS	FRESH AIR	0810	
0813	THIS COUNTRY IN THE MORNING	THIS COUNTRY IN THE MORNING		0813	
0900	(CBC NEWS at 0900 and 1000)	(CBC NEWS at 0900 and 1000)	CBC NEWS	0900	
0903			SUNDAY MAGAZINE	0903	
1000			CBC NEWS	1000	
1003			SUNDAY SUPPLEMENT	1003	
1100	NALLACHINE ΔΔΔ ΔΔΔ	ESKIMO NEWS ROUNDUP ΔΔΔΔΔ	HUMOUR	1100	
1110			TARORAMUIT CΔΔΔ	1110	
1130	CBC NEWS, WEATHER AND SPORTS	CBC NEWS, WEATHER AND SPORTS	CBC NEWS, WEATHER AND SPORTS	1130	
1145	RADIOJOURNAL & CHRONIQUE DU SPORTS	RADIOJOURNAL & CHRONIQUE DU SPORTS	RADIOJOURNAL & CHRONIQUE DU SPORTS	1145	
1200	CBC NEWS AND COMMENTARY	CBC NEWS AND COMMENTARY	CBC NEWS AND COMMENTARY	1200	
1205	THE ECLECTIC CIRCUS	OUR NATIVE LAND	CAPITAL REPORT	1205	
1300	NRC OFFICIAL TIME SIGNAL and CBC NEWS	NCR OFFICIAL TIME SIGNAL and CBC NEWS	NRC OFFICIAL TIME SIGNAL and CBC NEWS	1300	
1303	AU RISQUE DE VOUS PLAIRE & TENDREMENT	SHOWCASE '74	THE ENTERTAINERS	1303	
1400	RADIOJOURNAL & UN ARTISTE SE RACONTE	RADIOJOURNAL		1400	
1403		ÉCOLE BUISSONNIÈRE		1403	
1430	THE BOB KERR SHOW			1430	
1500		CONCERN	CBC NEWS	1500	11720
1503			THE BUSH AND THE SALON	1503	9625
1530	THE MAX FERGUSON SHOW		JAZZ EN LIBERTÉ TOUR DE CHANTE	1530	
1600	GILMOUR'S ALBUMS (Mon.)			1600	
	LONG AGO YESTERDAY (Tue.)				
	GREAT KEYBOARD MUSIC (Wed.)				
	POP SPECTACULAR (Thur.)				
	STUDIO '74 and NAT'L SCHOOL BDCSTS (Fri.)				
1700	THE WORLD AT FIVE	CBC NEWS AND SPORTS	CBC NEWS AND SPORTS	1700	
1715		MESSENGER REVIEW	ADVENTURES OF OOKPIK	1715	
1730	NORTHERN MESSENGER	ESKIMO NEWS ROUNDUP ΔΔΔΔΔ	VOICE OF THE PIONEER	1730	
1740			TARORAMUIT CΔΔΔ	1740	
1745	ESKIMO NEWS ΔΔΔΔΔ			1745	
1800	DE TOUS LES POINTS DU MONDE	RADIOJOURNAL	RADIOJOURNAL	1800	
1810		CHRONIQUE SPORTIVE	CHRONIQUE SPORTIVE	1810	
1815		LA BOURSE ET LA VIE	GENS DE MON PAYS	1815	
1820	CREE NEWS ΔΔΔΔΔ ΔΔΔ ΔΔΔ			1820	
1830	AS IT HAPPENS (CBC NEWS at 1900 and 2000)			1830	
1900		CBC NEWS	CBC NEWS	1900	
1903		GILMOUR'S ALBUMS	N.H.L. HOCKEY BROADCAST (Starting time varies)	1903	
2000		CBC NEWS		2000	
2003	ESKIMO LANGUAGE PROGRAMS ΔΔΔ ΔΔΔ	CBC STAGE		2003	
2030	NALLACHINE ΔΔΔ ΔΔΔ			2030	
2100	CBC NATIONAL NEWS & FROM THE CAPITALS	CREE MAGAZINE ΔΔΔ ΔΔΔ ΔΔΔ ΔΔΔ		2100	
2115	FIVE NIGHTS A WEEK AT THIS TIME			2115	
2130	ESKIMO NEWS ΔΔΔΔΔ	FAMILY FAVOURITES		2130	
2133			CBC NEWS	2133	
2145	CREE NEWS AND MUSIC ΔΔΔ ΔΔΔ ΔΔΔ ΔΔΔ ΔΔΔ ΔΔΔ		SHERLOCK HOLMES	2145	9625
2200	LE MONDE CE SOIR, AU RHYTHME DU MONDE & COMMENTAIRES	CBC NEWS	CBC NATIONAL NEWS	2200	5960
2203		ANTHOLOGY		2203	
2210			SOUND OF SPORT	2210	
2230	TERRITORIAL NEWS ROUNDUP (Mon.) DR. BUNDOLA'S PANDEMONIUM (Tue.) INSIDE FROM THE OUTSIDE (Wed.) OUR FRIENDS THE FLICKERS (Thur.) CBC PLAYHOUSE (Fri.)		RADIOJOURNAL	2230	
2240			THE DEMAND SIDE	2240	
2300	CBC NEWS	CBC NEWS	CBC NEWS	2300	
2303	IDEAS NETWORK (Mon.) SONG FLIGHT (Tue. and Wed.) COLLAGE (Thur.) BETWEEN OURSELVES (Fri.)	MIDNIGHT JAZZ	QUEBEC NOW	2303	
2400	CBC NEWS, NORTHERN WEATHER & SPORTS PERSPECTIVES	CBC NEWS, NORTHERN WEATHER & SPORTS MESSENGER REVIEW	CBC NEWS, NORTHERN WEATHER & SPORTS ADVENTURES OF OOKPIK	2400	
0015	COMEDY AND ENTERTAINMENT PROGRAMS	MY WORD	MUSIC OF OUR PEOPLE	0015	
0030	CBC NEWS AND SPORTS	CBC NEWS AND SPORTS	CBC NEWS AND SPORTS	0030	
0100	LE MONDE CE SOIR	RADIOJOURNAL ET CHRONIQUE SPORTIVE	RADIOJOURNAL ET CHRONIQUE SPORTIVE	0100	
0110	CHRONIQUE SPORTIVE	MUSIC INTERLUDE	MUSIC INTERLUDE	0110	
0122	END OF BROADCAST DAY	END OF BROADCAST DAY	END OF BROADCAST DAY	0122	
0130				0130	

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Comments and enquiries should be addressed to the CBC Northern Service,

P.O. Box 6000, Montreal, Quebec, Canada.

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Adresser toute correspondance ou demande de renseignements à Radio-Canada, Service du Nord,  
C.P. 6000, Montréal, Québec, Canada.



## CANADIAN NATIONAL RAILWAYS (CNR)

### Responsibilities

As the development of the North continues at an accelerated rate, new demands are being created for transportation and telecommunications facilities and services. To serve the needs arising from increased resource exploration, industrial and business activities as well as social needs, Canadian National will continue to expand its telecommunication services and facilities. Although the predominant demand is for telephone services, Canadian National Telecommunications is able to provide other types of public and private telecommunications services including teletypewriter and data transmission.

Canadian National is also involved in research activities into the technical, social and economic feasibility of various transportation modes to determine which would be most suitable for the Canadian North.

### Review of 1973-74 Operations

During the fiscal year 1973-74, CN Telecommunications continued its expansion program. Two new communities, Fort Liard and Wrigley, received local and long distance telephone service. Long distance facilities were also extended to Gjoa Haven and Pelly Bay in the Arctic and telephone and data communication facilities which serve the exploration activities in the Mackenzie Delta were upgraded and expanded.

Direct Distance Dialing (DDD) service, which was introduced at Whitehorse at the end of 1972, was extended to the communities of Faro, Elsa, Dawson City, Watson Lake, Inuvik and Tuktoyaktuk. A microwave spur, which will improve both the quality and the reliability of long distance service was extended to Elsa. Public Mobile Telephone service channels were added to Arctic Red River, Fort Simpson and Rat

Pass in the Northwest Territories. An Air/Ground service which interconnects with the public telephone network via the Inuvik office was established.

A number of telephone exchange expansion or replacement projects were undertaken in 1973; these included Cassiar, Fort Smith, Edzo, Yellowknife, Whitehorse, Inuvik, Norman Wells, Fort McPherson, Pine Point, Rae, Hay River and Fort Simpson.

Fifty-nine exchanges were in service at year end serving a total 22,575 telephones. This includes 14,667 main stations which represents an increase of 8.6 percent over the previous year. Also, a substantial increase of 22 percent in completed long distance calls (including DDD) was recorded.

At Otter Falls, which is approximately 70 airline miles northwest of Whitehorse, Northern Canada Power Commission is constructing a \$15 million hydro-electric plant. CNT is providing the telephone and telex service for this project. The telex exchanges at Hay River and Grande Prairie were upgraded and expanded and now these connect directly with Calgary.

Canadian National continued its membership in Canadian Arctic Gas Study Ltd, the consortium of Canadian and U.S. companies proposing to build the Mackenzie Valley gas pipeline. The first formal application for this pipeline was presented to both the National Energy Board and the Federal Government in March of this year. While CN was involved in many aspects of this feasibility study and proposal, its primary function was to provide for the logistics planning, in conjunction with Canadian Pacific. This role was undertaken for CN by Canalog Logistics Ltd, a subsidiary company which is able to provide a wide range of logistics management services.

Canadian National also participated through Canalog Logistics Ltd in a study funded by the Federal Government to investigate the feasibility of constructing a railway to transport oil and natural gas from the Mackenzie Delta and the Alaskan North Slope to their southern markets. Canadian Pacific is also involved in this undertaking. The study, which is still in progress, is considering three different route configurations and 28 oil and gas production possibilities ranging from 3/4 billion to 7 1/2 billion barrels of oil a day and from 1/2 million to 1 million standard cubic feet of gas a day. To date, the study group has found that this railway is technically feasible; however, the analysis of cost, the construction details and the overall summary are yet to be completed. This assessment will be forthcoming early this summer.

### Plans for 1974-75

CN Telecommunications will continue to expand its facilities and services in 1974-75. A microwave system with an ultimate capacity of 300 voice channels is under construction from the existing system at Fort Simpson to Norman Wells. Completion is scheduled for the summer of 1974 and then this system will be able to provide a continuous path back to Hay River.

New stored-program electronic telephone exchanges are being installed at Hay River and Inuvik and these will be in service by June and October of 1974 respectively. Additional communities will receive direct distance dialing service later this year with equipment which is now being installed at Hay River is made ready for service. Long distance service at Dawson City will be improved when a microwave spur is completed in 1974.

To increase the area of coverage and also handle the increased volume of calls, additional public mobile telephone base stations will be placed into operation during 1974 at Fort Simpson, Ebbutt, Saline, Fort Norman, Fort Good Hope, Arctic Red River and Rat Pass in the Northwest Territories and Dawson City in the Yukon. Telephone service via HF radio at Holman Island, Inuvialuk and Snowdrift will be upgraded by providing local dial exchanges and associated long distance channels directly connected to CN's toll office.

#### Long-term Plans

Canadian National will continue its research activities into the various modes of transportation suitable to the Canadian North.

Canalog Logistics Ltd hopes to increase its involvement in the North through the provision of services to resource development activities and perhaps to the problems of community resupply. One of the aims of this new CN subsidiary is to assist future economic growth, especially in our northern regions, and to help this development to proceed in an orderly fashion.

Canadian National Telecommunications will continue to expand its local and long distance telephone service to keep pace with the growing number of subscribers. The Mackenzie Valley microwave system will be extended from Norman Wells to Inuvik thus completing a continuous microwave highway from Inuvik to Hay River. Construction of a microwave system between Fort Simpson and Fort Nelson which will interconnect with the Mackenzie Valley system is also planned.

## CANADIAN TRANSPORT COMMISSION (CTC)

### AIR TRANSPORT COMMITTEE

#### Responsibilities

The licensing of air carriers to operate commercial air services; the economic regulation of air carriers; investigations and surveys relating to the operation and development of commercial air services in Canada and advising the Minister of Transport on matters relating to civil aviation.

#### Long-term Plans

Normal planning to meet responsibilities.

#### Review of 1973-74 Operations

GAP Pine contracts were awarded to Labrador Airways Ltd. and Nordair Ltd. as follows for the period July 1, 1973 to June 30, 1974.

##### *Labrador Airways Ltd.*

Between Goose Bay — Hopedale and return

##### *Nordair Ltd.*

From Frobisher Bay to Resolution Island — Saglek — Goose Bay  
Saglek — Resolution Island — Frobisher Bay

The DEW Line contracts for the period July 1, 1973 to June 30, 1974 were awarded to:

Vertical DEW Line airlift — Transair Ltd.

Lateral DEW Line airlift — Nordair Ltd.

Supervision and co-ordination of these contractual arrangements continue.

#### Authorities granted during 1973

- Class 4 Group ARW Charter service from a base at Fort Simpson, N.W.T.

- Class 4 Group A Charter service from a base at Norman Wells, N.W.T.
- Class 9-4 International Charter Group C service from a base at Inuvik, N.W.T.
- Class 9-4 International Charter ABC service from bases at Whitehorse and Inuvik, N.W.T.
- Class 9-4 International Charter AB service from bases at Dawson, Y.T. and Mayo, Y.T.
- Operate of a Lockheed Hercules L-100-20 aircraft at Yellowknife, N.W.T.
- Class 4 Group A Charter service from a base at Fort Simpson, N.W.T.
- Class 4 Groups A, B, C and D Charter service from a base at Resolute Bay, N.W.T.
- Class 7 Specialty, Aerial Application and Distribution, Aerial Inspection, Reconnaissance and Advertising, from a base at Whitehorse, Y.T., using Group A aircraft.
- Class 4 Groups B and C Charter service from a base at Rankin Inlet, N.W.T.
- Class 4 Group A Charter service from a base at Rankin Inlet, N.W.T.
- Class 4 Group B Charter service from a base at Whitehorse, Y.T.
- Class 7 Specialty, Aerial Control, service from a base at Fort Smith, N.W.T.
- Class 7 Specialty, Aerial Control, service from a base at Watson Lake, Y.T., using rotating wing aircraft.
- To serve the additional points Rae-Edzo, Lac La Matre and Raes Lakes, N.W.T.
- Class 7 Specialty, Aerial Control, Aerial Construction, service from a base at Fort Simpson, N.W.T.

- To serve the additional points Igloodik, Hall Beach and Repulse Bay, N.W.T.
- To operate Class 9-4 International Charter service with 4 DC3 and two DC6 AB aircraft from Yellowknife, N.W.T. in lieu of DC3 aircraft only.
- To operate two D aircraft, in addition to Groups A, B and C from Fort Simpson, N.W.T.
- To operate Group C aircraft in addition to Groups A, B and Ross River, Y.T.
- To operate Group D aircraft (restricted two DC3 aircraft) at Hay River, N.W.T.
- To serve the additional point Fort Simpson, N.W.T.

#### Participation in Studies on Northern Air Transport

Air Transport Committee staff participated in the working group convened by the Arctic Transportation Agency to monitor Gemini North Limited whose Mackenzie Valley Air Survey was completed in May 1973. The objectives of this survey were to describe airport facilities, aircraft movements, traffic flows historically, and to consolidate estimated future traffic requirements of pipeline contractors.

Personnel of the Canadian Transport Commission were also nominated to participate in a Northern Air Policy Study announced May 29, 1973 to seek the opinions of carriers and users in examining the problems of air transportation in the Yukon and Northwest Territories. This study will require a considerable amount of office and field work this year in preparation for delivery of the report in 1974.

## CENTRAL MORTGAGE AND HOUSING CORPORATION (CMHC)

### Responsibilities

Design of housing, preparation of town development plans, and drafting of planning legislation as requested from time to time by the Department of Indian Affairs and Northern Development.  
Financing of housing under the terms of the National Housing Act.

### Long-term Plans

The facilities provided under the National Housing Act and the services of Central Mortgage and Housing Corporation will be made available wherever and whenever necessary.

### Review of 1973-74 Operations

#### Funding Activities

In 1973 a total of 681 new housing units were financed under the NHA, compared to 599 in 1972. Of these, 172 units were in the Yukon: 33 were financed by approved lenders, and 139 by CMHC; 509 units were in the Northwest Territories: 443 were financed by approved lenders and 66 by CMHC.

Twenty-eight loans for existing housing were made in the Yukon, two by CMHC, 26 by approved lenders. In the N.W.T. 25 loans for existing housing were made, 15 by approved lenders and 10 by CMHC.

In addition, loans were provided by CMHC for the construction of 93 units of public housing for rental to low-income families. Of these, 41 units were in the Yukon: 10 in Carmacks, five in Pelly Crossed, five in Tetlin, three in Carcross and 18 in Whitehorse. Fifty-two units were constructed in the Northwest Territories: 12 in Yellowknife, 20 in Frobisher Bay and 20 in Inuvik.

Loans were also provided by CMHC to non-profit corporations under Section 15 of the N.H.A. for the construction of 125 units for rental to low-income families. Of these, 96 were constructed in Whitehorse and 29 in Hay River.

In addition to loans made available under the N.H.A., second-mortgage loans were provided by the governments of the Yukon Territory and the Northwest Territories. CMHC administers the mortgage plan on behalf of the Territorial governments. During 1973, eight loans in the N.W.T. and seven in the Yukon were negotiated, bringing the total of second-mortgage loans to 169 since the inception of the program in 1962.

#### Partnership Activities — Northwest Territories

##### Aklavik

A feasibility study is underway on the financing of eight units for senior citizens.

##### Fort Good Hope

In September 1973, a contract was awarded for the construction of eight units for senior citizens. As of January 1, 1974 construction was well underway and completion is expected by September 1974.

##### Fort Resolution

In June 1973, a contract was awarded for the construction of eight units for senior citizens. As of January 1, 1974 construction was 96 per cent complete.

##### Hay River

In November 1972, a contract was awarded for the construction of 16 units for senior citizens. Construction began in 1973 and this project was completed and occupied in the same year.

##### Yellowknife

A feasibility study is still underway on financing some 36 units for low-income families.

#### Sewage Treatment Loans

##### Hay River

One loan was made available to this municipality for the construction of sewage collection facilities comprising approximately 1,200 lineal feet of forcemain and a pumping station.



### Research Grants and Studies under Part V NHA 1954

In 1973 the following Part V grants were made in the Territories:

Métis and Non-Status Native Association of N.W.T.	Emergency House Repairs to replace previous Winter Warmth Program	\$100,000
Yukon Association of Non-Status Indians.	Emergency House Repairs to replace previous Winter Warmth Program.	\$ 78,500
Yukon Association of Non-Status Indians.	Overruns incurred on their 1971-72; 1972-73 Winter Warmth Program.	\$ 17,008

### Plans for 1974-75

The following public housing proposals are presently under consideration:

#### Lending Activity

##### *Yukon Territory*

Beaver Creek	3 family units
Carcross	3 family units
Carmacks	5 family units
	5 senior citizen units
Haines Junction	5 family units
Mayo	3 family units
Ross River	10 family units
Teslin	5 family units
Watson Lake	20 family units

It is also anticipated that the Yukon Territorial Government will lease from private owners several housing units, to be rented to low-income families.

##### *Northwest Territories*

(Senior Citizen or Family Units)

Hay River	20
Yellowknife	20
Inuvik	20
Frobisher Bay	15
Rankin Inlet	10
Fort Smith	10

#### Partnership Activities

##### *Northwest Territories*

Yellowknife	36 family units
Aklavik	8 senior citizen units
Frobisher Bay	10 senior citizen and family units

### Revenue and Expenditures/1972-73

Name of Department or Agency	N.W.T.		Yukon Territory	
	Revenue	Expenditures	Revenue	Expenditures
Central Mortgage and Housing Corporation	\$1,364,000	\$2,282,000	\$1,641,000	\$1,012,000

## CROWN ASSETS DISPOSAL CORPORATION (CADC)

### Responsibilities

Crown Assets Disposal Corporation is responsible for the sale of surplus assets reported by government departments and agencies operating in northern Canada and under a long-standing agreement conducts the sale of United States Government surplus property located at DEW Line sites and other northern establishments. The Corporation also has an agreement to act as agent of the Government of the Northwest Territories in the sale of their surplus assets.

### Long-term Plans

The Corporation will continue to provide service to federal government departments and to United States government agencies, with respect to the sale of their surplus assets located in the North.

### Review of 1973-74 Operations

Special sales were conducted during the summer and autumn at Whitehorse, Churchill and Goose Bay. The U.S. surplus property located at DEW Line Stations was sold to individuals or organizations operating in the area.

### Plans for 1974-75

The Corporation will conduct normal sales operations and be ready to assist in any special disposal problems that may arise at Canadian or U.S. establishments.

### Revenue & Expenditure 1972-73

Name of Department or Agency (by Branch if applicable)	N.W.T. Revenue-Expenditure	Y.T. Revenue-Expenditure
Crown Assets Disposal Corp.	\$114,840.90 —	\$119,728.74 —

## DEPARTMENT OF AGRICULTURE (AGR)

### Responsibilities

To provide technical assistance through consultation and research to those in the North needing information on matters dealing with food production;

To provide an identification and consultative service on insects, arachnids, nematodes, plants and soils to meet Canada's scientific and operational requirements in the North.

### Long-term Plans

To maintain our present level of operation in the North. Governments of both the Yukon and Northwest Territories have sought the help of agrologists in preparing land-use policies and allocating lands for agricultural production. There appears to be a renewed interest in agriculture north of the 60th parallel.

### Review of 1973-74 Operations

#### Northern Research Group, Beaverlodge, Alberta

Assessment for agricultural production potential of the Slave River Lowlands continues. Climate of the area has been recorded for six years. Mean temperature, followed by the maximum and minimum for the three summer months was: June - 61°F, 85°F, 23°F, respectively. The average of six years' rainfall was 5.33 inches with June providing 1.36 inches, July 1.84 inches, and August 2.13 inches. In 1973 rainfall exceeded the average with June providing 2.74 inches, July 3.61 inches and August 2.72 inches for a total of 9.19 inches of precipitation.

Yields of brome and alfalfa continue to be good even after three years of cutting. Up to 4,000 pounds per acre were produced in a single mid-July cut. Other forages providing reasonable tonnage are timothy, crested

wheat-grass and in one site birdsfoot trefoil. Native sedge and grass produced better than a ton per acre over the sites sampled in mid-August, which at that time showed a crude protein content between nine per cent and 12 per cent.

A more extensive soil-vegetation survey was conducted over chosen areas of the lowlands. Records were made on 45 sites in an attempt to delimit the extent and seriousness of the saline soil areas. This was to have been correlated with a low level aerial photographic scanning, using infrared and colour film to separate vegetation types. Inclement weather cancelled the photography. This has now been rescheduled for June 1974.

Some research on one site was conducted in cooperation with the Soils Department of the University of Alberta to determine the degree of nitrogen recycling under native vegetation on a humic gleysol.

Inspections were made on three areas on behalf of the Department of Indian and Northern Affairs along the Hay River to determine suitability for farming. The sites inspected were deemed unsuited for large scale agricultural production because of soil variability. Some chosen parts would support limited vegetable production.

#### Plans for 1974-75

Plots, both native and cultivated, will be harvested as scheduled. A second attempt will be made to provide air pictures in an attempt to correlate with ground records and thus help to delimit different degrees of arable soil.

A summary of all work on the lowlands will be prepared and the project partially phased out.

#### Biosystematics Research Institute, Ottawa, Ontario

The Institute continued to identify aquatic insects collected by the Freshwater Institute, Environment Canada, from the Mackenzie and Old Crow Rivers and their tributaries. Approximately 80,000 specimens were identified. In support of this identification service four Institute personnel collected aquatic insects in the Fort Simpson, Old Crow and Mackenzie River Delta areas. Taxonomic support was also provided for CCIBP projects on Cornwall and Devon Islands. One research scientist collected insects along the Dempster Highway in the Yukon Territory.

Checksheets and reports for 10 sites in the Mackenzie District were completed for the CCIBP/CT Panel 10 group. A member of the Institute attended the fifth meeting of Panel 10 at which all the proposals for ecological reserves within the panel area were discussed.

Two research papers on northern flora were submitted for publication.

#### Plans for 1974-75

The Institute will continue to identify aquatic insects collected by the Freshwater Institute in their study of the Mackenzie River and its tributaries. Taxonomic support will be provided also for the CCIBP project on Devon Island. One research scientist will collect insects in southern Yukon.

It is anticipated the manuscript for a Flora of the Continental Northwest Territories will be submitted for publication by the end of 1974.

#### Soil Research Institute, Ottawa, Ontario

Several pedologists from the Soil Research Institute and its soil survey unit cooperated with other disciplines and

departments, mainly the Geological Survey of Canada and Canadian Forestry Service, in terrain and ecological surveys in the North. These programs were sponsored by the Environmental-Social Program, Northern Pipeline.

Reports and maps for the Mackenzie Valley Transportation Corridor, based on 1971 and 1972 investigations were completed by members from Winnipeg (C. Arnocai) and Edmonton (W.W. Pettapiece). The former, in association with CFS personnel, conducted further detailed studies along the corridor and reports on this work are being prepared.

Short term investigations were carried out in the eastern Arctic and Melville Island by scientists from Saskatoon (D.F. Acton) and Ottawa (J.A. McKeague) respectively.

These projects are now terminated but the investigators are still active on a consultative basis.

#### Plans for 1974-75

A Manitoba-based pedologist (C. Arnocai) will continue cooperating with the S.C. in terrain investigations in the North sponsored by the Environmental-Social Program.



## DEPARTMENT OF COMMUNICATIONS (DOC)

**Responsibilities**

The Department of Communications was established in 1969 to foster the orderly development and operation of telecommunications for Canada in the domestic and international sphere. This includes: recommending national policies and programs with respect to communications services for Canada; promoting the development and efficiency of Canadian communications facilities; assisting Canadian communications systems to adjust to changing conditions; allocating radio frequencies to permit the orderly use of radio communications; protecting Canadian interests in international telecommunications matters; and coordinating telecommunications services for departments and agencies of the Government of Canada.

**Review of 1973-74 Operations**

The Department continued field experiments in northwestern Ontario and in the Keewatin, N.W.T., under its Northern Pilot Project. The project, undertaken in 1972, was designed to use three types of hardware according to need: high frequency radio; videotape equipment; and low power FM broadcasting transmitters.

Support continued to the inter-community radio-telephone system established in the Keewatin in autumn, 1972 with the help of the Department. This system now links five communities: Baker Lake, Chesterfield Inlet, Rankin Inlet, Whale Cove and Eskimo Point. Training courses were offered to teach people selected by each community how to operate and maintain the HF radios.

A low power FM community radio station was set up in Baker Lake under the Northern Pilot Project. Operated by the Qamanittuap Naalautaa Society, CKQN

went on the air February 15, 1973, broadcasting in English and Inuktitut. Videotape was used to explain the role of the radio station to the people of Baker Lake. Six people from Keewatin settlements took part in a VTR course in April and May.

In the Mackenzie, a trail communications project was undertaken to evaluate the usefulness of lightweight portable HF radio equipment in providing two-way communication between trapline camps and the home community. In December, 1973, four units were tested in the Fort Franklin area in cooperation with the Indian Brotherhood of the Northwest Territories, using their base station at Fort Franklin. Another unit was tested at Snare Lake, north of Yellowknife.

The Department of Communications continued to provide financial support to CN Telecommunications to an amount of \$160,000 for the year ending December 31, 1973 for operation of a telecommunication system from Fort Simpson to Inuvik. In the Eastern Arctic, the Department had a contract with CNT for \$120,000 for maintenance of the federally owned tropospheric scatter terminal at Frobisher Bay to provide government telecommunication with centres in southern Canada over the Polevault system.

During 1973, CN Telecommunications introduced local and long distance telephone service to Fort Liard and Wrigley, N.W.T. Long distance service was extended to Pelly Bay and Gjoa Haven. In the Yukon, the exchange at Mile 285 on the Alaska Highway was removed; its subscribers are now served from Muskwa.

Also in 1973 the communities of Faro, Elsa, Dawson City, Watson Lake, Inuvik and Tuktoyaktuk were provided full access to the Direct Distance Dialing Network. (This

follows the installation of DDD equipment at Whitehorse late in 1972.)

Telephone exchange expansion or replacement projects undertaken include Cassiar, Fort Smith, Edzo, Yellowknife, Whitehorse, Inuvik and Fort McPherson.

By the end of 1973, 59 exchanges were in operation in CNT's Northwestern Region serving a total of 14,667 subscriber lines and 22,575 telephones.

The quality of service to the Eastern Arctic was improved with the introduction of satellite service in January, 1973.

Bell Canada is using one channel of the Anik satellite to serve Frobisher and Resolute and it can also serve other locations with a similar heavy traffic demand. A second channel provides service to Iglood and Pangnirtung and will provide service to 15 other locations as well as meeting the needs of resource exploration companies. Six of the 15 locations were cut into satellite service early in 1974. Bell Canada is providing service by satellite to Fort Chimo, Povungnituk, Baker Lake, Coral Harbour and Big Trout Lake. Ontario Northland Communications provides similar service to Winisk.

The replacement of HF radio service by satellite service has resulted in a five-fold increase in traffic.

Agreement was reached with Panarctic Oils Limited for the provision of private service to their base camp at Rea Point. The service will use a recently developed transportable earth station.

Bell Canada made the following service improvements in addition to the introduction of satellite service:

- new equipment buildings were provided at Sandy Lake, Povungnituk, Poste d'

Baleine, Lac Mistassini, Baker Lake and Coral Harbour; new switching equipment was provided at Winisk; HF radio service was extended to Port-Nouveau-Québec, Bellin and Ivugivik. During the year the Bell Canada plant serving Labrador was sold to the Newfoundland Telephone Company.

ANIK II, Telesat Canada's second communications satellite, was launched from Cape Kennedy on April 20, 1973, and positioned in equatorial orbit  $5^{\circ}$  to the east of ANIK I, at  $109^{\circ}$  longitude.

ANIK II was designed primarily for space protection to ANIK I Canadian customers. The successful operation of the company's first satellite, however, permitted Telesat the opportunity of leasing channel capacity on ANIK II on an interim basis. In early April, Telesat signed an agreement with RCA Global Communications/RCA Alaska Communications for the lease of one full period channel and one occasional use channel on ANIK II to carry telecommunications traffic between Alaska and the forty-eight contiguous states.

The CBC expanded its satellite transmission services as more and more Telesat remote television stations were linked to the CBC's relay facilities. By the end of February, 1974, a total of twenty-seven remote communities across Canada were receiving the network television programming in colour.

On March 4, 1974, the CBC began occasional use service on a fourth ANIK I channel. The additional satellite capacity allows more flexibility in the CBC's regional distribution and permits uninterrupted network programming on the three other channels.

Telesat's initial baseline system of earth stations was completed in 1973 and the implementation program to provide Thin Route service at fifteen additional locations for Bell Canada's Northern Service was started.

Telesat also began building prototypes of two classes of transportable earth stations. The larger is designed for television transmission and reception and is road transportable; the smaller will have Thin Route capability and is to be air transportable by a Twin Otter size aircraft.

Negotiations during the Summer and Fall of 1973 with the appropriate common carriers and major oil companies led to a three-month test of satellite communications using a ten-foot transportable earth station.

The test program which was carried out under actual operating conditions in the winter months of 1974, provided voice and telex communications at three petroleum exploration sites in the Mackenzie Delta.

Considerable engineering activity was devoted to studies related to the provision of additional services to Telesat's present and potential customers. Chief among these was the design of a satellite communications system to provide communications for the proposed Canadian Arctic Gas Pipeline in the Mackenzie Valley.

#### Plans for 1974-75

As of March 31, 1974, the Northern Pilot Project will have completed its scheduled two years, and the Department will withdraw from direct involvement. Local groups will continue to operate the communications systems set up through the projects, using skills acquired in operation, maintenance and management during the experimental period. A report on the evaluation of this project has been completed and will be used in the development of policies to respond to the need for particular communication services in remote areas of Canada.

Two studies of mobile facilities in the north will be carried out during 1974. The Department in cooperation with the Yukon Territorial Government and concerned federal agencies will commence a comprehensive review of government VHF requirements in the Yukon. In the Mackenzie Valley, a study of present and emerging VHF radio requirements will be carried out by a working group chaired by a representative of the Department.

The Department of Communications hopes these studies will contribute to the development of a viable market for commercial systems in these areas. It also expects to study plans for meeting communications requirements for the proposed northern pipeline. The timing of this study will depend on the progress of the pipeline applications.

Plans will be finalized for a cooperative program of technical and social impact experiments to be conducted on the Communications Technology Satellite. This non-commercial experimental satellite is due to be launched in late 1975 or early 1976.

The prototype transportable earth stations being built by Telesat will be available by the end of summer, 1974. Plans call for the smaller 15-foot terminal to be installed at Rea Point on Melville Island.

Telesat is finalizing an agreement with Bell Canada for the provision of Thin Route service to Rea Point, an exploration site of Panarctic Oils. The agreement calls for a two-month trial period with an option to continue service for fifty-eight months. The terms also provide for the relocation of the transportable station at the request of Panarctic Oils.

Telesat plans to award contracts for five additional transportable message terminals in August, 1974. The acquisition of these terminals will place the company in a more favourable position to meet present and potential customer requirements.

Telesat continues to explore new avenues for satellite service with the CBC. One avenue to be investigated in 1974 is the transmission of both television and radio programming through a single satellite channel permitting the source of the signals to originate from different locations. If the experiment proves feasible, a new dimension will be added to regional radio broadcasting.

Telesat will also explore the possibilities of television transmission from locations north of the 60th parallel. Agreement has been signed with the CBC and Bell Canada for a live television transmission on May 1, 1974 from the Telesat earth stations at Resolute and Frobisher Bay.

Preparations are going ahead for the launch of ANIK III scheduled for the first quarter of 1975.

Nine Thin Route stations are tentatively scheduled for service during the 1974-75 fiscal year. The sites selected by Bell Canada for this service are Rankin Inlet, the Belcher Islands, Cape Dorset, Eskimo Point, Fort Severn, Pond Inlet, Port Harrison, Poste de la Baleine and Sagluc. Private line teletype service will be provided to some of these locations, and voice and teletype service will be provided to Panarctic Oils base camp and Rea Point.

Bell Canada plans the following service improvements in addition to the new satellite services:

- new exchanges at Kashechewan, Sagluc and the Belcher Islands;
- improved switching equipment at Fort Albany, Sandy Lake;
- new equipment buildings at Inoucdjouac, Pond Inlet, Rankin Inlet and the Belcher Islands.

CNT plans to extend long distance service to the community of Spence Bay in 1974. Direct Distance Dialling will be provided this year to Hay River, Yellowknife, Fort Smith, Fort Simpson and Pine Point. Equipment is

now being installed for this purpose in Hay River.

New telephone exchanges are being planned for Paulatuk, Holman and Snowdrift and the feasibility of providing long distance facilities to these communities is under examination.

Telephone exchange expansion and replacement projects planned for 1974 and extending into 1975 include Carmacks, Clinton Creek, Faro, Haines Junction, Mayo, Porter Creek, Watson Lake, Whitehorse (Upper Whitehorse Exchange), Fort Nelson, Mile 92, Muncho Lake, Cassiar, Muskwa, Dease Lake, Aklavik, Arctic Red River, Coppermine, Edzo, Fort Providence, Fort Simpson, Fort Smith, Hay River (both main and satellite exchanges), Inuvik, Pine Point, Yellowknife, Cambridge Bay, Fort Good Hope, Wrigley and Pelly Bay.

Additional mobile base stations are planned for the Northwest Territories communities of Ebbutt, Saline, Fort Norman, Fort Good Hope and Fort Smith. In the Yukon new base stations are planned for Blackstone, Eagle River, Ogilvie, Laberge, Freer Creek, Frances, Finlayson, Hoole, Ross River, Faro, Minto, King Solomon, Dawson City, Klondike, Chapman, Mickie and Fox.

Dependent on the MacMillan Pass project, new base stations would be provided at Canol sites 1 and 2. Additional channels are planned for several mobile base stations including those at Fort Simpson, Norman Wells, Arctic Red River and Rat Pass.

A microwave system with an ultimate capacity of 300 voice channels is under construction from the existing system at Fort Simpson north to Norman Wells. Completion is scheduled for summer of 1974. It is planned to extend the system into the Mackenzie Delta in 1975. Site clearing will commence this year in preparation for the construction of a 900 channel capacity microwave system from Fort Simpson to Fort Nelson, B.C. Microwave will be extended this year to the Yukon communities of Dawson City and Ross River with a further extension to Clinton Creek scheduled for 1975. Existing radio systems from Hay River to Pine Point and Lady Franklin Point to Coppermine are being upgraded and expanded in capacity. The communities of Wonowon, Teslin, Haines Junction, Destruction Bay, Muncho Lake, Coal River and Beaver Creek are scheduled for radio inter-connection to the Grande Prairie/Alaska heavy route microwave system during 1974-75. This will result in

higher quality and more reliable general communications. Preliminary planning of facilities for use during the construction phase on the proposed Mackenzie Gas Pipeline is being undertaken this year.

Modern stored-program electronic telephone exchanges are currently being installed in new building at Hay River and Inuvik. There is continuing upgrading and expansion of telephone and data communication facilities serving exploration activities in the Mackenzie Delta. Telephone and telex service has recently been extended to Otter Falls 70 miles north of Whitehorse for the Northern Canada Power Commission, which is engaged in construction of a \$15 million hydro electric project. Facilities are also on order to provide similar service to another NCPC hydro-electric project on the Snare River 80 miles northwest of Yellowknife.

#### **Long-term Plans**

The Department of Communication's long-term aim is to extend communications frontiers so as to eliminate regional disparities and to ensure that at least basic communications services are available to all Canadians. In its long range planning, the Department is paying particular attention to the impact of communications systems on Canadian cultural and social values and the quality of life in Canada, as well as on the Canadian economy.



## DEPARTMENT OF ENERGY, MINES AND RESOURCES (EMR)

### MINERAL DEVELOPMENT SECTOR

#### Responsibilities

The Mineral Development Sector is responsible for the formulation of national policies on mineral resources; the collection and publication of data and information on mineral resources, mining activities, mineral legislation, and economics of the mineral industry; research and analysis of the economics of the mineral industry, on a commodity and industry basis, and in a regional, national and international context; the regulation of the manufacture, transportation and storage of explosives; and the provision of financial assistance to the gold mining industry. The aim is to realize optimum economic and social benefits for Canadians through effective mineral source management.

Specifically relating to the two Territories, the Sector provides advice on, and participates in, the policy formulation, program planning and project evaluation processes of the Department, interdepartmental committees and other departments, in particular the Department of Indian and Northern Affairs. Advice and recommendations on matters of mineral taxation are also provided to the Department of Finance and the Department of National Revenue.

#### Long-term Plans

The Sector will continue to advise on, and participate in programs and activities that are related, wholly or in part, to mineral exploration, development, exploitation and utilization, and economic development of the North.

#### Review of 1973-74 Operations

The Mineral Development Sector continued to be represented on a number of

government committees concerned with the North: the Co-ordinating Committee and EOS (ice strengthened vessels) Project Working Group of the Advisory Committee on Northern Development; the Advisory Committee on Northern Roads; the Northern Roads and Airports Administrative Group; and other specific committees and working groups.

The Sector continued to advise and remain in close contact with the Department of Indian and Northern Affairs — with that department retaining overall responsibility for mineral development in the two Territories. Technical advice and recommendations were provided to the Department of National Revenue and the Department of Finance on taxation matters relating to the mineral industry under the Income Tax Act — the benefits accorded to the mineral industry are, of course, also applicable to mining operations in the two Territories. Applications are assessed on an individual basis, and field investigations are quite often necessary for this purpose. The effects of federal and territorial legislation on the mineral industry are constantly under review. During 1973 the Department was represented on the Foreign Investment Review Interdepartmental Committee. The Foreign Investment Review Act ensures that the control of existing or new enterprises including mineral industry companies, by persons other than Canadians, will be of significant benefit to Canadians.

The Sector continued to administer the Emergency Gold Mining Assistance Act, introduced in 1948 to provide financial assistance to marginal gold mines. The provisions of the Act were extended to June 30, 1976, and field trips were made to the gold mining districts during the year under review. The only payments made during the calendar year 1973 were \$290,540 of

holdback payments to gold mine operators, which applied to the calendar year 1971. Due to the higher prices available on world markets, Canadian gold producers have not been selling to the Royal Canadian Mint since the end of 1971. Consequently, no payments have been made under the Act on 1972 or 1973 production. Payments made under the Act from 1948-1971 now total \$303,101,402.

Updating and revision of the Yukon and northwest Territories sections of the National Mineral Inventory continued throughout the year. A card inventory is maintained of all new mineral discoveries and developments associated with previously discovered mineral occurrences and producing orebodies. Approximately 400 and 900 entries have been prepared for the Yukon and Northwest Territories respectively. The information is made available to the Department of Indian and Northern Affairs in Ottawa and to the resident government geologists at Whitehorse and Yellowknife. All mineral resource companies and other interested parties also have access to information contained in the Inventory.

The resource potential evaluation and regional development sections of the sector continued to monitor mineral industry developments and to provide information to departmental personnel who participate in interdepartmental activities relating to the North. A number of special studies were carried out in 1973, some of which, while national in scope, had equal relevance to the North:

- Estimates of the potential impact of a Mackenzie Valley railway on mineral development in the North were prepared as input to the Arctic Railway Study carried out by the Ministry of Transport.



- Studies were done on ore discovery on ore discovery costs of the past. This work was pursued in some detail and with considerable care, to provide an insight into what the exploration dollar really accomplished in the past and what it can be expected to accomplish in the future. The results of this work were summarized in a paper presented at the 1973 annual meeting of the Prospectors and Developers Association.
- A review was made of offshore minerals, to assess the possible impact on Canada's onshore mining operations, and to estimate when offshore mining might make itself felt, given the uncertain legal atmosphere that pervades offshore mining plans.
- The sector undertook to make estimates, for the benefit of policy-makers, of the anticipated requirements for the major metals produced in Canada, and the degree to which these requirements are likely to be met from current producing mines and mines which are expected to go on-stream in the near future. Such estimates provide an impression of the number, location, and size of the additional new mines which will have to materialize in the future.

Everyday activities of the sector frequently involve, or have implications, for the North. The same applies to special studies which are national or international in scope. This applies in particular to the officers of the sector who are concerned with the mineral industry on a commodity basis. During 1973, particular attention was paid to proposed mine developments in the Arctic Islands. Apart from assessments of the individual projects themselves, this necessitated an appraisal of northern development objectives and challenges generally, and assessments of further mineral potential in each locality. The energy minerals, uranium, oil and gas continued to receive special attention due to recent Arctic developments, the particular problems of energy supply and demand over the 1973-74 winter, and the Department's responsibility for national energy policies. Although no special studies were carried out, the sector continued its interest in important commodity implications — notably the use of Canadian sources of barite for northern drilling operations and sulphur for road and building construction purposes.

Officers of the sector continued to assist with, and participate in conferences and

seminars concerned with the North. In particular, in 1973, were the Sixth National Northern Development Conference and the Churchill Arctic Corridor Conference. The sector was also active in the preparations for the 1973 Man and Resources Conference, sponsored by the Canadian Council of Resource and Environmental Ministers. The program Task Force reports, and the results of the 1972 Workshops at Montebello, were reviewed. Where the expectations of these reports corresponded with existing or contemplated departmental programs and activities, information on such programs and activities was provided as input to the conference. The Department response to the guidelines produced by the conference is now being formulated in an attempt to contribute to the final recommendations of the program. Although formal input and participation by the Department is now ending, any future CCREM developments will be monitored.

A number of social and natural environment studies are either underway or are being initiated in conjunction with other federal departments. These are both specifically related to the North or are nationwide but are of equal importance or of particular relevance to the North:

- A study of the environmental and economic effects of pollution controls on mineral industry operations, in particular mining and smelting operations.
- The development of economic profiles of mining communities.

In addition, the sector sponsored a study of the history of mining in Canada's national parks, its impact on the landscape, and the policies and attitudes regarding such resource use. This study included a case study of mining activity in the Kluane National Park in the Yukon.

The sector continued to provide the department focal point for the inter-governmental development of a mineral policy for Canada. Provincial and federal ministers (including the Territories) responsible for mineral policy in their respective governments concluded a series of meetings in Ottawa on April 13, 1973 which resulted in an agreement to set up a formal mechanism for consultation and co-operation in the development of the national mineral policy. This resulted in the creation of the Canadian Ministerial Conference on Mineral Policy, on November 23, 1973. Also during the year the document entitled

Mineral Policy Objectives for Canada was published as the basis for further discussion by ministers. Specific attention to the northern regions of Canada is contained in this document.

The Explosives Division of the sector continued to license agencies and operators who handled or used explosives in the two Territories. The volume of this work continued to grow with the recent increases in mineral exploration and development, and associated infrastructure construction. Frequent field inspections were carried out. In the fall of 1973 this division was transferred to the Science and Technology Sector of the Department.

#### Plans for 1974-75

It is expected that the functions and activities of the sector will remain essentially the same during the forthcoming year. The Emergency Gold Mining Assistance Act will continue to be administered but further payments to gold mine operators under the terms of the Act are not expected due to the high prices on the world gold markets.

The sector anticipates participation in special studies on the national mineral and energy policies, both of which affect the North, on transportation activities particularly along the Mackenzie Valley and in the southern Yukon, and on mineral developments in the Arctic Islands.

Officers will continue to participate in seminars and conferences concerned with aspects of mineral development in the North, and will carry out field investigation and inspections as necessary.

#### THE CANADA CENTRE FOR REMOTE SENSING (CCRS)

##### Responsibilities

The Canada Centre for Remote Sensing is responsible for promoting and co-ordinating a national program of remote sensing designed to produce information for a fuller assessment and better management of Canada's environment and earth resources. The centre's activities include the following:

- airborne remote sensing.
- spaceborne remote sensing.
- research and development of new remote sensing devices.
- development and demonstration of techniques for using remote sensing.

## Review of 1973-74 Operations

### Airborne remote sensing

Six airborne remote sensing missions were scheduled for the Northwest Territories during 1973-74, although adverse weather resulted in the cancellation of four missions. However, the two missions which were flown accounted for 101 line miles, and both involved studies in glaciology.

One of these remote sensing missions was flown at the request of Dr. J.P. Johnson of the Geography Department, Carleton University. The objective was an investigation in the Kluane Range of Southwestern Yukon Territory of the use of colour infrared film in the identification and classification of rock glaciers as well as similar or related features. The data is now being analyzed.

The purpose of the other airborne mission, flown at the request of Dr. P.G. Johnson of the University of Ottawa's Geography Department, was to determine, by means of colour infrared, thermal infrared, black and white infrared, colour, as well as black and white panchromatic imagery, the probable future degradation of a terminal moraine of the Donjek Glacier, Southwestern Yukon Territory. Analysis of the data obtained from this airborne mission is also in progress. Imagery from airborne remote sensing operations can be viewed by the public at the National Air Photo Library.

### Spaceborne remote sensing

The processing to imagery of data transmitted from the first of a series of earth resources satellites (ERTS-1) launched by NASA in July, 1972 is one of the main activities of the centre's spaceborne remote sensing program. ERTS-1 is equipped with a multispectral line scanning device whereby optical energy is sensed in four bands from 0.4 to 1.1 micrometers. Imagery is processed in all four energy bands, and is available for Canada north to latitude  $81^{\circ}$ . Also available are false colour imagery produced from combinations of the four optical energy bands. Imagery is processed to a format of  $1/4'' \times 7 \frac{1}{4}''$ , and to a scale of 1:100,000. Satellite orbits are designed so that complete coverage of the earth occurs every eighteen days. However, at higher latitudes, repeat coverage can be as frequent as on consecutive days out of the normal fifteen-day cycle. While precision processed imagery is available from the National Air Photo Library, "quicklook" imagery is available within days of a satellite pass.

In addition a daily microfiche subscription service has been provided, covering one imagery band for all ERTS-1 scenes recorded in Canada. Quicklook imagery coverage from ERTS-1 has already proven beneficial for navigation in ice infested waters of the Canadian Arctic. In fact, during 1973, the use of ERTS-1 quicklook imagery made it possible for a seismic ship to survey an area it would not otherwise have surveyed. Remote sensing of sea ice has additional benefits which are discussed in a detailed CCRS report.

### Research and development of new remote sensing devices

During 1973-74, the centre continued to support research and development of new remote sensing devices; contracts totalled \$100,000. Most of the sensors under research and development have practical applications in assessing and managing northern environment and resources.

The development of microwave remote sensors, with all-weather operational capabilities, are particularly useful in the Canadian north. The current program, in conjunction with various government departments, entails the commission and the evaluation of a microwave scatterometer and of a microwave radiometer. These sensors have potential for identifying ice types, measuring sea-state, and identifying characteristics of uniformly varying terrain and vegetation. As well, preliminary results from the testing of holographic radar for measuring ice thickness have been encouraging. Work is progressing on the development of a laser fluorosensor, an instrument that could have practical applications in the monitoring of pollution in northern waters. Other sensors currently under development include a laser bathymeter and a soil moisture measurement system.

### Development and demonstration of techniques for using remote sensing data

Joint projects are currently in progress on the development and the demonstration of techniques for using data acquired by remote sensing in northern Canada. The objective of one such study is to assess the usefulness of ERTS-1 imagery as a means of obtaining low-cost resource management information over large expanses of the North, while another remote sensing project is concerned with demonstrating the use of ERTS-1 imagery in mapping permafrost ecological systems in northern areas including those in the districts of Mackenzie

and Keewatin. While several mosaics have been constructed from the standard inventory of ERTS-1 imagery, higher quality mosaics can be constructed by using imagery, all of which was produced in a single processing operation. Therefore, the centre is prepared to consider reprocessing in a single batch all imagery data to be used for a single mosaic.

### Plans for 1974-75

The present level of spaceborne, airborne, and applied research will continue in 1974-75. In addition, test flights for a number of new sensors potentially useful in remote sensing of the North, including the laser bathymeter, the microwave scatterometer and the low light level television camera are scheduled for 1974-75. Also, additional sensors will be interfaced to the centre's airborne data acquisition system. The quicklook facility at Prince Albert will be modified to record and distribute on an experimental basis the very high resolution radiometer data from the NOAA-2 and NOAA-3 satellites whose coverage include northern Canada. Finally, the centre anticipates delivery of an off-line automatic digital interpretation system in early 1974 which will allow rapid construction of thematic maps from ERTS data.

### Future Plans

The centre is presently investigating the acquisition of decoding equipment necessary to allow extension of satellite support for ground data collection platforms within Canada, and particularly in the Arctic. Finally, a number of joint remote sensing projects proposed for the North for 1975-76 are contingent on additional budgetary funds. Such projects would involve terrain analysis in support of exploration on Banks Island as well as in support of the Polar Gas Project, and navigational support for the Arctic.

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## EARTH PHYSICS BRANCH

### *Division of Seismology*

#### **Responsibilities**

The Division of Seismology provides a seismological risk and engineering seismology service in northern Canada and studies all thermal aspects of permafrost. Research in the Arctic lithosphere is conducted by deep-sounding experiments (often in cooperation with the Polar Continental Shelf Project), by surface wave dispersion studies and by geothermal methods. To meet these objectives, networks of seismic observatories are deployed in northern Canada so as to take advantage of the low-noise terrain; field experiments on deep seismic sounding or microseismicity are conducted; in cooperation with industry and other government agencies boreholes are preserved and thermal measurements made.

#### **Review of 1973-74 operations**

First-order seismic observatories were operated at Alert, Mould Bay, Resolute, Frobisher, Inuvik, Yellowknife, Baker Lake, Churchill and Schefferville. The regional seismic observatory at Great Whale River continues to be operated under contract by Laval University, Institute of Northern Studies. The regional seismic observatory at Whitehorse continued operation, as did the strong motion site at Fort McPherson. The Yellowknife seismic array continued operation; an extension to the array control centre laboratory was made to house an on-line digital detection processor which was installed and tested.

Routine analysis of all detected earthquakes occurring in the Canadian North has resulted in publication of two annual catalogues, and a new service has been initiated

which will provide preliminary epicentres within six months for all detected earthquakes.

Field work continued on some 40 deep Arctic wells drilled by resource development industry in order to investigate the thickness and distribution of permafrost in northern Canada and to study its relationship to terrestrial heat flow, the surface temperature history and the surface topography. Studies continued of the shallow permafrost regime of the Mackenzie Valley in holes drilled by the Geological Survey of Canada, as did studies on the thermal properties of frozen soils on acquired cores.

Long-range refraction studies were undertaken by three field parties in May in the Sverdrup Basin in cooperation with a G.S.C. experiment to outline the Basin's depth and structure.

#### **Plans for 1974-75**

Tests will continue of an on-line digital detection processor at Yellowknife, and requirements for a new wide-band down-hole system will be studied. Seismic observatories elsewhere will be calibrated and updated, and plans made for network extension if such is required for northern environmental impact studies in the high Arctic. Routine analysis of detected earthquakes in the Canadian North will produce three more annual catalogues. A special study of an extensive series of earthquakes near Melville Island will commence.

Geothermal studies will continue and expand with the increasing pace of resource development: some experimental work on permafrost degradation near shorelines will commence on the Beaufort Sea margin in order to assess the possibility of permafrost beneath the sea-floor. Long-range refraction studies of the oceanic crust are planned for April 1975 in conjunction with the AIDJEX program.

Results from these programs will continue to be published in scientific and technical journals and made available to industry, the public and the scientific community.

#### **Long-term Plans**

The seismological observatories will be maintained and kept technologically up to date: some temporary expansion may take place in key areas of the Arctic islands, and strong motion instrumentation may be added at a small number of sites. Field research on microseismicity, seismic risk and

tectonics may be extended to the high Arctic. Cataloguing will continue of all earthquakes detected in the Canadian North.

Deep crustal seismic sounding experiments are planned for the Arctic Ocean Basin, and are under study in northern Quebec and Labrador. Studies will continue of the underground thermal regime of northern Canada, in cooperation with the Polar Continental Shelf Project and resource industries in the arctic archipelago, and in the Mackenzie Valley in association with engineering geology studies.

### *Division of Geomagnetism*

#### **Responsibilities**

The Division of Geomagnetism is responsible for providing information on the direction and intensity of the earth's magnetic field over Canada and the neighbouring ocean areas and important applications for all types of navigational charts. Other practical applications arise from the magnetic properties of the rocks in the earth's crust. In addition to investigating large-scale geological structures by magnetic methods, the division provides basic data for the more detailed commercial exploration of deposits of minerals, oil and gas. The magnetization of rocks is analysed in field and laboratory studies to learn where and how geological structures were formed. The division is also responsible for recording and analysing the more rapid variations of the geomagnetic field; the fact that much of the northern auroral zone lies within the Canadian landmass gives Canada a special responsibility in this field. Studies of rapid magnetic variations have practical applications in the North for telecommunications, long-distance transmission of electric power and the investigation of deep crustal structure by electromagnetic induction.

#### **Review of 1973-74 Operations**

During 1973, 17 magnetic repeat stations in the District of Franklin were used as part of a continuing program to determine the rate of change of the earth's magnetic field. This information is required to update navigation charts.

A special survey was made to determine the position and secular motion of the northern magnetic dip pole. Four recording stations were operated in the Bathurst Island area encircling the predicted pole position within a radius of 100 miles. The dip pole coordinates in May 1973 were 76.5°N, 101.4°W,

and it continues to move northward at five nautical miles per year.

Crustal studies of electromagnetic induction methods were continued in 1973 with six recording magnetometer stations operated between Resolute and Isachsen for a few weeks during May and June. Analysis of previous data from Ellesmere Island and Lincoln Sea has revealed the presence of a highly anomalous structure deep in the crust.

Magnetic observatories operated continuously through 1973/74 at Baker Lake, Cambridge Bay, Churchill, Mould Bay, Poste la Baleine and Resolute Bay. Construction started on a new magnetic observatory at Yellowknife and six unattended magnetic recording stations in a north-south line passing through Churchill were operated in support of auroral and rocket research programs.

#### Plans for 1974-75

A three-component airborne magnetic survey with flight lines 20 miles apart is planned for the fall of 1974. It will cover northern Manitoba and Ontario, the District of Keewatin, most of Hudson Bay and part of Baffin Island.

To study crustal structure at the Arctic continental margin, several portable magnetic recording stations will be operated on the ice of Beaufort Sea along a profile crossing the continental slope. This work is supported by the polar Continental Shelf Project. The profile will extend about 200 miles seaward from the west coast of Banks Island and near Cape Prince Alfred.

#### Long-term Plans

Three-component airborne magnetic surveys are planned to cover the North, including the Canadian sector of the Arctic Ocean, at intervals of a decade or so. Some magnetic repeat stations are reoccupied at five-year intervals in a continuing study of magnetic secular variation. The history of the formation of the Arctic Basin is to be studied using paleomagnetic data from the Arctic Islands, as well as the magnetic anomalies revealed by airborne surveys. Other field investigations of the northern part of the Precambrian Shield will be made using electromagnetic induction. The network of permanent magnetic observatories will be supplemented by unattended automatic recording stations, especially during the

International Magnetospheric Study, from 1976 to 1978.

#### Gravity Division

##### Responsibilities

The Gravity Division is responsible for completing the regional gravity survey of the Canadian North. This work is performed in cooperation with the Polar Continental Shelf Project. Precise observations of gravity provide basic data for the mineral exploration industry, for basin studies and for studies of the earth's crust and upper mantle; in addition, these observations provide data for studies in physical geodesy and for the needs of the Department of National Defence. The division is also responsible for maintaining gravity standards in Canada's North by establishing a first-order gravity network to serve as reference and control points for all other regional and detailed gravity surveys conducted in the North, and by maintaining a data bank of all gravity data which meet national standards. This Division is also an active participant in the Arctic Ice Dynamics Joint Experiment (AIDJEX), through its program to measure horizontal and vertical movements of the Arctic Sea ice. Precise observations of earth tides are also made in Arctic regions as part of a program to determine the deep structure of the earth and the processes operative within these regions.

#### Review of 1973-74 Operations

In 1973-74, 754 gravity stations were observed on the ice-covered Amundsen Gulf by a field party supported by helicopter. Station spacing was maintained at four-mile intervals. The surveyed area is adjacent to the northern margin of the Gulf, beginning at a point about 80 miles west of Sachs Harbour and following the southerly coast of Banks Island. The strip of stations has an average width of 25 miles and terminates near the western shore of Victoria Island north of Holman Island. During the survey a gravity meter range was established in the vicinity of Cape Parry to provide control for the surface gravity meter survey carried out by C.S.S. *Parizeau* later in the year.

During August and September more than 9,800 miles of surface gravity meter measurements were made from the C.S.S. *Parizeau* in the central portion of the Gulf between longitudes 120° and 125°. Profile track spacing averaged one mile. This survey was a cooperative project with the Geological

Survey of Canada and the Canadian Hydrographic Service of the Department of the Environment.

During the year, four studies were published describing the results and interpretation of gravity data. One joint study with the Geological Survey of Canada described gravity profiles across ice-cored topography in the Tuktoyaktuk Peninsula.

A recording earth tide gravimeter was operated continuously at Alert throughout the year. The records are of interest because of the proximity of the meter to the pole and the maximum amplitude of the little known Polar Tide.

#### Plans for 1974-75

Operational plans for 1974-75 include a helicopter-supported gravity survey of the western and eastern extremities of Amundsen Gulf during the spring season. Approximately 1,200 gravity stations are planned. During May, plans call for detailed gravity observations along a seismic refraction line which crosses the Sverdrup Basin from Peary Channel to Norwegian Bay. This is a joint operation with the Geological Survey of Canada. A complete inspection and updating of the gravity control network in the Arctic will begin in 1974.

Analysis and interpretation of gravity data from Arctic areas will be continued during 1974.

The earth tide gravimeter will continue to be operated in polar regions. If feasible, the recording site will be shifted to Resolute late in the year.

The AIDJEX experiment will begin in February 1975 and continue for 15 months. Sea ice and ocean surface tilt will be monitored continuously throughout this period.

#### Long-term Plans

The main objectives of the Gravity Division's program in the North are to map the gravity field at intervals of 15 km or less over the land and water (ice) covered regions of northern Canada, to maintain a first-order gravity network in northern Canada, to develop and improve methods of measuring gravity under unstable conditions such as in ice-covered regions, and to study long- and short-term vertical and horizontal movements of the crust, and physical geodesy. Gravity data are also made available to the resource industry at cost of retrieval from the national gravity library.



## GEOLOGICAL SURVEY OF CANADA (GSC)

### Responsibilities

To provide a comprehensive inventory and understanding of the geological framework for use not only in the search for mineral and energy resources and in the wise utilization of the landmass, but also in the decision making processes that result in national policies and which affect the lives of all citizens.

The activities of the Geological Survey are an integral part of the scientific programs of the Department of Energy, Mines and Resources. They are designed to assist in policy and management decisions by providing a comprehensive inventory and understanding of the geology of Canada, with particular emphasis on:

- ascertaining Canada's energy and mineral resources
- facilitating their exploration and development
- promoting regional development in Canada
- identifying and describing geological features and processes that affect environmental and ecological equilibrium, with particular emphasis on the effects of energy and mineral development
- identifying and studying those features of the recent geological past and ongoing processes that affect the use of the landmass, engineering design, urban development, and renewable resource industries such as forestry, agriculture and fisheries
- identifying and assessing natural hazards (e.g. areas prone to landslides)
- disseminating information on the landmass of Canada and its surrounding continental shelves for use by other government agencies, industry and the general public.

### Long-term Plans

The long-term plans of the Geological Survey north of 60° differ only in emphasis from the total program of the branch, a description of which accompanied the 1972 edition of this report.

Although the National Bedrock Geological Reconnaissance will be completed at a minimum scale of 1:500,000 by 1976 for all of Canada, there are parts of the Precambrian Shield where reconnaissance insufficiently depicts the complex geology,

and more detailed pre-1945 mapping is obsolescent. There are about 260 1:250,000 map-sheets that require upgrading; most of these are in the Northwest Territories. Data from such re-mapping is needed to enhance mineral resource evaluation studies but it does not seem possible, from present resources, technology and other priorities, to complete this work until the end of the century.

The Geological Survey, with a wide range of expertise and information, is being called upon increasingly for participation in intra-departmental programs. To date such demands have been greatest in the field of terrain studies where involvement with the Environmental Social Program, Northern Pipelines, has been considerable. The basic data for such contributions cannot be collected at short notice and thus the Geological Survey places considerable emphasis on completing an inventory of the unconsolidated deposits and landforms of the North.

The government's energy policy stipulates that Canada should become self-sufficient, and the next few years will see an increasing proportion of the Geological Survey's activity devoted to this objective. Thus, increasing importance will be given to field studies concerned with the petroleum potential of the Arctic and to the environmental problems inherent in developing such resources.

Many Canadians consider our supplies of uranium adequate to meet expansions in the field of nuclear energy. Such is not the case and Canada could face a grave shortage of uranium and thorium by the end of the decade. Greatly increased government activity to encourage exploration by industry can be expected in the near future.

The demand for energy may be crucial in early 1974 but the need for self-sufficiency in other mineral commodities is also recognized and this will undoubtedly lead to further prospecting throughout the North — where the minerals most in demand will dictate the kind and extent of exploitation. As mentioned, the National Bedrock Reconnaissance of Canada is all but complete, and thus a basic tool for prospecting such potentially important areas as the northern part of the Canadian Shield is available. The Survey's ongoing program of updating these maps and of carrying out more detailed mapping where necessary will also be of importance to any extension of our mineral-producing areas.

### Review of 1973-74 Operations

During 1973-74, about 150 of the Geological Survey's 493 projects were concerned with the Northwest and Yukon Territories. Not all of these involved field work nor did field work always involve a major expenditure of time and effort but, as has been the case for some years, more than half of the GSC total effort was expended north of 60°. Preliminary results of studies carried out by the Geological Survey between April and late October 1973 were released to the public in early January as Paper 74-1 Part A. The following paragraphs "highlight" some of the published reports:

In 1972, a geochemical reconnaissance of 36,000 square miles of the Canadian Shield east of Great Bear Lake was carried out. An analysis of the data obtained indicated that although some interpretation was possible based on previous studies of primary and secondary geochemical dispersion, a more authoritative interpretation required follow-up studies. The area chosen for such studies in 1973 was about 100 miles south of Bathurst Inlet. Specific anomalies were studied and the results, which will assist greatly in general interpretation, were published in Paper 74-1 Part A. A most encouraging result of these studies is the conclusion that whereas geochemical methods have had only limited success in mineral exploration in the southern Shield, they appear eminently suited to these more northern areas and indeed, in places, the terrain may be close to ideal.

A litho-geochemical survey of felsic porphyritic rocks, carried out in the Bear River area, extended from the abandoned Rayrock mine north to latitude 60°. About 2,200 samples were collected and these are being analyzed for 15 major, minor and trace elements. A variety of sulphide mineral showings were examined and previously unrecorded occurrence of copper staining was reported. Field observations indicate that the felsic volcanic units of the Wopmay geological sub-province may be a better than average place to prospect for volcanic exhalative-type sulphide accumulations.

Seismic refraction data were obtained from the Sverdrup Basin along a 120-mile traverse running from south of King Christian Island across Amund Ringnes Island to the west coast of Axel Heiberg Island. This work extended the co-operative project undertaken in 1972 by government and industry.

Aeromagnetic surveys were continued in various parts of the North in 1973-74. A total of 18,182 line miles was flown over a part of Melville Peninsula and an additional 4,000 line miles over an area extending west from Hudson Bay at the latitude of the Melville River.

Several field parties were active on Melville Peninsula. Petrological studies were made of the metamorphic rocks of the Penrhyn Group. Another party examined the paragneisses of the Prince Albert Group and added new data concerning the iron formations known to occur in these rocks. A third group studied the well-exposed, wide variety of Precambrian rocks between Backbar Inlet and Erlandsen Bay, western Melville Peninsula.

Studies designed to upgrade knowledge of Precambrian geology were carried out in Patterson Lake [65G (W 1/2)]; Ferguson Lake [65 I (W 1/2)]; Indin Lake (86B) and Pease River (86K) map-areas. Interim results from each of these activities were published in Paper 74-1 Part A.

Six projects were carried out as part of the Environmental Social Program Northern Territories. The subjects included were: The effects of surface disturbance on ground ice conditions and distribution; Surficial geology and land classification of the Mackenzie Valley Transportation Corridor; Terrain sensitivity evaluation and mapping, Mackenzie Valley Transportation Corridor; Review of geotechnical data, Mackenzie Valley, and Quaternary stratigraphy and geomorphic processes on the Arctic Coastal Plain.

During the 1973 field season, a program of mapping and laboratory study was begun on the various sediment types that are associated with two distinct types of permafrost: patterned ground, mud boils and frost mounds. Samples were collected from an area west of Chesterfield Inlet and were examined at a field laboratory set up at Backbar Inlet. The results of this study will have general application throughout the North.

Any large scale northern development will depend on terrain information and during 1973 the Geological Survey continued its program of inventory mapping and stratigraphic studies. Field studies of the surficial geology and geomorphology of Backbar Island were continued as were field studies on Foshheim Peninsula where considerable attention was given to quantifying terrain disturbance. A

40,000-square-mile area south of Chesterfield Inlet was examined in support of the preparation of a 1:125,000 air photo interpretative map of surficial materials. Ground observations were made with sufficient frequency to allow material types and properties to be assigned to map-units established for the photo-map. In addition, samples of terrain types in problem areas were taken in order to improve interpretation of terrain units that will be delineated on large-scale settlement maps.

Natural and man-induced thermokarst processes were investigated on eastern Banks Island and a study was started of coastal erosion and sedimentation in eastern Melville Island and western Byam Martin Island. If inter-island gas pipelines become a reality, the land-water interface will be of great importance. Another coastal investigation was begun along the northern coast of Somerset Island.

Studies in stratigraphy (and allied subjects), designed to improve our knowledge of an ability to correlate potential areas of hydrocarbons, were conducted in various parts of the North.

In continuing study of uplifts in northern Yukon Territory, Barn Uplift was examined. These uplifts show great structural relief in a relatively small area and the likelihood of associated structural closure and updip truncation of strata make them prime targets for hydrocarbon exploration.

A study of Cambrian rocks in the Peel River area of the Yukon continued, and selected sections were examined of lower and middle Paleozoic rocks in the headwaters of the Wind and Bonnet Plume rivers.

The Devonian, Cretaceous and Tertiary strata of Banks Island were studied during a six-week long field project. A comprehensive report on these studies is included in the Survey's "Report of Activities" Paper 74-1 Part A.

#### Plans for 1974-75

Of the 410 projects being carried out by the Geological Survey of Canada in 1974-75, about 125 are north of 60° and of these, 64 have a field component.

The largest project, Operation St. Elias in the Yukon, will complete the reconnaissance bedrock mapping north of 60°. The mapping of the rugged terrain of Canada's highest mountains and extensive ice fields will require two helicopters to service geologists mapping at 1:250,000 scale and also those carrying out complementary

stratigraphic, volcanic and metallogenic studies. They will also service those carrying out terrain studies 1:125,000 as part of the terrain inventory for Kluane National Park. The terrain studies are being supported by Parks Canada.

Elsewhere in the southern Yukon, stratigraphic and structural studies will be carried out in Selwyn and Pelly Mountains as a basis for understanding the widespread distribution of lead and zinc deposits within these regions that are currently undergoing vigorous exploration for mineral deposits.

Bedrock studies in the Precambrian Shield, aimed at upgrading the former reconnaissance mapping to modern 1:250,000 standards and at the same time attaining a clearer understanding of the geological evolution of the region, are required to understand the distribution and origin of the mineral deposits. In 1974, bedrock mapping will be undertaken on Sloan River (86K) and Calder River (86F) map-areas in the Bear Geological Province. Bedrock studies on sedimentary and volcanic rocks are being undertaken in the Goulburn Group and in the Yellowknife supergroup in the Slave Province.

Regional studies and mapping mentioned above will be continued along the Prince Albert Group Belt in southern Melville Peninsula and structural, stratigraphic and metamorphic studies will be continued along the Penrhyn Belt northeast of Repulse Bay. The northeasterly continuation of the Penrhyn Group in Baffin Island is also the focus for new bedrock investigations in 1974.

Stratigraphic and structural studies, as part of basin analyses in order to understand the environment of hydrocarbon distribution in Sverdrup Basin, will be carried on by several parties in the Queen Elizabeth Islands. Studies of the Lower Paleozoic and older rocks to further identify the geological framework of the Canadian Arctic and to determine the setting for base metal deposits, will continue in northern Ellesmere, southwest Ellesmere and Devon Islands and Cornwallis Island.

Stratigraphic and structural studies, integrated with subsurface data as part of basin analyses to aid in the evaluation of oil and gas potential, are being continued in the Mackenzie Delta region and in the northernmost Mackenzie Mountain region and northern Yukon fold complex west of Mackenzie Delta.



The regional lake sediment geochemical lake surveys undertaken in 1972 (discussed in this and the preceding report) are continuing in Bear-Slave Provinces. The significance of anomalies is being investigated further in order to aid in future interpretations.

Various terrain studies are a most important part of the Geological Survey's activities in the Arctic in 1974. Standard geological mapping of surficial deposits and landforms as a basis for subsequent classification and assessment, of the terrain's sensitivity and capability for use and development, particularly for pipeline routes, is being carried out in central Ellesmere Island, on Bathurst and Cornwallis, on Boothia Peninsula and on Banks Island. Work will also continue in the Beaufort Sea-Mackenzie Delta region and in Mackenzie Valley corridor studies under the Environmental Social Program — Northern Pipelines. Marine-based offshore investigations will also take place in Beaufort Sea and in Lancaster Sound.

Several studies are being conducted on geological processes in the Arctic. Studies of coastal processes are being undertaken preparatory to the construction of coastal installation and pipelines, etc., particularly in relation to movement of nearshore ice. These studies are being carried out along the northern coast of the Yukon and the coast of Melville Island and Barrow Strait. Studies of geomorphological processes related to thermoskarst, palsa development, etc. will be conducted along Mackenzie Valley. Further investigations are being undertaken in Mackenzie Valley in relation to terrain assessment of the transportation corridor and the processes of erosion and permafrost, slope processes, terrain sensitivity, the rate of recovery of terrain from various uses and the engineering properties of permafrost terrain. Special attention is being given to the geology of northern settlement areas.

Aeromagnetic surveys by contract will be continued in the Melville Peninsula westward to the Coppermine River area. High sensitivity airborne gamma ray spectrometer surveys will be continued across the northern part of Bear-Slave Province.

Another operation of the Geological Survey in 1974 in the Arctic will be participation in the cruise of the *R.V. Hudson*. Phase 2 of the cruise in August will have a variety of activities in Smith Sound, southern Kane Basin, Lancaster Sound and Barrow Strait. Coring and surficial studies will be made by scientists of the Terrain

Sciences Division who will also be available on other phases of the trip to provide input.

#### Reports Relating to the Northwest Territories and Yukon Territory, published by the Geological Survey in 1973-74.

##### Memoirs

- 366 Geology of the Flat River, Glacier Lake and Wringley Lake map-areas (95E, L, M), District of Mackenzie and Yukon Territory, by H. Gabrielse, S.L. Blusson and J.A. Roddick, 1973.
- 374 Geology of the Port Radium map-area (86K-4 and part of 86L/1). District of Mackenzie, by G. Mursky, 1973.

##### Bulletins

- 214 Classification and description of copper deposits, Coppermine River area, District of Mackenzie, by E.D. Kindle.
- 223 Ordovician trilobites from the Keele Range, northwestern Yukon Territory, by W.T. Dean, 1973.

##### Papers

- 71-22 Sekwi Mountain map-area (105P), Yukon Territory and District of Mackenzie, by S.L. Blusson.
- 72-21 Geology of Nueltin Lake and Edehon Lake map-areas (65A W 1/2 and 65B), District of Keewatin, by K.E. Eade.
- 72-28 Fossil strobiloblasts of *Cristatella mucedo* Cuvier in the Beaufort Formation and in interglacial and post-glacial deposits of the Canadian Arctic, by M. Kuc.

- 72-37 Description palynology and paleoecology of the Hassel Formation (Cretaceous) on eastern Ellef Rignes Island, District of Franklin, by W.S. Hopkins, Jr. and H.R. Balkwill.

72-42

72-45

72-47

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##### Maps

1357A

1358A

Feasibility study of geochemical sampling of Arctic coastal streams by helicopter based on a Department of Transport icebreaker, by Willy Dyck.

Drift prospecting; geochemistry of eskers and tundra permanently frozen terrain: District of Keewatin; Northwest Territories, by W. Shilt.

Geology of Tavani map-area (55K), District of Keewatin, by W.W. Heywood.

Reconnaissance geochemistry using lake sediments of a 36,000-square-mile area of the northwestern Canadian Shield, by R.J. Allan, E.M. Cameron and C.C. Durham.

Granulite facies rocks on northeastern Devon Island, Arctic Archipelago, By J. Krupicka.

Three new lower Paleozoic formations of the Boothia Peninsula region, Canadian Arctic Archipelago, by R.L. Christie.

Publications on the geology of the Arctic Islands, by the Geological Survey of Canada revised May 1973. Compiled by R.L. Christie.

Medial Lower Cambrian trilobites from the Mackenzie Mountains, northwestern Canada, by W.H. Fritz.

Geology, Sawyer Bay, District of Franklin, compiled by J.Wm. Kerr, 1972. Lat. 79-00 to 80-00; Long 76-00 to 80-00. N.T.S. Sheet 39G. Scale: 1:250,000.

Geology, Dobbin Bay, District of Franklin, compiled by J.Wm. Kerr, 1972. Lat. 79-00 to 80-00; Long. 72-00 to 76-00. N.T.S. Sheet 39H. Scale: 1:250,000.

359A	Geology, Kennedy Channel and Lady Franklin Bay, District of Franklin, by J.Wm. Kerr, 1972. Lat. 80-00 to 81-15; Long. 64-00 to 72-00. N.T.S. Sheet 120B. Scale: 1:250,000.	O.F. 153	An unedited report on the distribution and correlation of the three oldest Paleozoic rock units in the Boothia Peninsula region, Canadian Arctic Archipelago, by R.L. Christie.	O.F. 161	Unedited geological report entitled, "Reconnaissance Geology of Aishihik Lake, Snag, and part of Stewart River map-areas, west-central Yukon", by D.J. Tempelman-Kluit.
Open Files		O.F. 155	Preliminary drafts of four surficial geology and geomorphology maps with legend of part of the Mackenzie Valley comprising parts of Fort Norman (96C), Carcajou Canyon (96D), Norman Wells (96E) and Sans Sault Rapids (106H) map-areas at a scale of 1:125,000.	O.F. 167	Preliminary drafts of three surficial geology and geomorphology maps with legends of part of the Mackenzie Valley and northern Yukon Territory comprising Trail River (106L), Bell River (116P) and part of Old Crow (116-O and 116-N (E 1/2) map-areas at a scale of 1:125,000, prepared by O.L. Hughes and J. Pilon and based on aerial photograph interpretation supplemented by field data collected by O.L. Hughes, J. Pilon, J.J. Veillette, S.C. Zoltai and W. Pettapiece, 1972.
F. 131	Terrain Maps — Mackenzie Valley. Preliminary drafts of Terrain Classification and Sensitivity Maps (consisting of six maps and a legend — Scale: 1:250,000) of Kakisa River (85D), Sibbeston Lake (95G), Root River (95K), Wrigley (95O), Dahadinni River (95N) and Bulmer Lake (95I), compiled by R.L. Monroe.	O.F. 157	Preliminary drafts of Terrain Classification and Sensitivity Maps (consisting of five maps and one sheet of legend material. Scale: 1:250,000) of N.T.S. 85E (Mills Lake); N.T.S. 95A (Trout Lake); N.T.S. (Fort Liard); N.T.S. 95J (Camsell Bend) and N.T.S. 95H (Fort Simpson).	O.F. 174	Preliminary draft of 1:1,000,000 geological atlas sheets of Eureka Sound and Robeson Channel areas, Canadian Arctic Islands (N.T.S. 560, 340 and Canadian part of 120), by H.P. Trettin. Unedited manuscript, based on information published prior to April 1973, as well as some unpublished information obtained by officers of the Geological Survey of Canada, covering Axel Heiberg and Ellesmere Islands north of 80° latitude and comprising the following items:
F. 144	Preliminary draft of Terrain Classification and Sensitivity Maps, consisting of one map and a legend. Scale: 1:250,000 of N.T.S. 96C (Fort Norman), compiled by R.L. Monroe.	O.F. 158	Preliminary drafts of 11 surficial geology and geomorphology maps and a legend of part of the Mackenzie Valley comprising Kakisa River (85D), Mills Lake (85E), Trout Lake (95A), Fort Liard (95B), Sibbeston Lake (95G), Fort Simpson (95H), Bulmer Lake (95I), Camsell Bend (95J), Root River (95K), Dahadinni River (95N), and Wrigley (95O) map-areas at a scale of 1:125,000, compiled by N.W. Rutter, A.N. Boydell, G.V. Minning and J.A. Netteville based on field work done in 1971 and 1972.	O.F. 177	<i>North Yukon And Mackenzie District, N.W.T.</i> An edited report describing the stratigraphy, facies and paleogeography of Jurassic and Cretaceous rocks of northern Yukon Territory and District of Mackenzie, N.W.T. (N.T.S. 116 I, J, L, O, P and 117A), by J.A. Jeletzky.
F. 145	A revision to part of Open File 132, one of the series Terrain Classification and Sensitivity Maps, consisting of one map and a legend. Scale: 1:250,000 of N.T.S. 96D (Carcajou Canyon), compiled by R.L. Monroe.	O.F. 159	Unedited geological map at a scale of 1:125,000 of Amund Ringnes and Haig-Thomas Islands, District of Franklin (parts of 59C, 59F, 69D and 69E) accompanied by a legend and table of formations. Geology by H.R. Balkwill, K.J. Roy, W.V. Sliter and W.S. Hopkins based on field work done in 1971 and 1972.	O.F. 179	A preliminary geological map of the Rankin Inlet (55 K/16) area at a scale of 1:31,680 has been prepared by P.J.
F. 147	A map showing structural contours on the top of the Precambrian surface from the Slave River sheet (N.T.S. 85), by G.K. Williams. It covers the area between latitudes 60 to 64 degrees north and longitudes 112 to 120 degrees west, based on information from well data to March 1971.				
F. 149	Unedited report showing the structural geometry and geological history of the northern Canadian Cordillera, by D.K. Norris.				
F. 151	Unedited report entitled, "Tips On Organizing Arctic Geological Field Work", by J. William Kerr, consisting of 32 pages of text and three illustrative figures.				



Laporte and S.K. Frape for Indian and Northern Affairs Department. The map shows the outcrop pattern and the mineral occurrences of the district as well as the geology.

- O.F. 182 *Palynology Of An Upper Cretaceous Section, Horton River, District of Mackenzie, N.W.T.* An unedited report on the micro-floral assemblages, ages and zonation in an Upper Cretaceous section from the Horton River, District of Franklin, Northwest Territories, by D.J. McIntyre.

- O.F. 187 *Colour Aerial Photography, Northwest Territories and Western Canada.* Flight logs and index maps relating to vertical colour aerial photographs obtained from three project areas in the late summer of 1973. In all three areas, the missions were flown at 7,500 feet above average ground level using a Wild RC 10 camera and Kodak 2445 (colour negative) film. The average photoscale in all areas is 1:15,000.

- O.F. 188 *Airborne Radioactivity Maps And Profiles District of Keewatin, N.W.T.* Maps and profiles of radioactivity data obtained with the Geological Survey of Canada airborne gamma-ray spectrometer system relating relating to the District of Mackenzie, Northwest Territories, covering mapsheets Marian River (85N), Wecho River (85O), Carp Lakes (85P) and MacKay Lake (75M).

- O.F. 189 Preliminary draft of surficial geology and geomorphology map of Mackenzie Valley Transportation Corridor (southern part, 60° to 64°N) at the scale of 1:1,000,000, compiled by A.N. Boydell and N.W. Rutter. Preliminary draft of surficial geology and geomorphology map of Mackenzie Valley Transportation Corridor

(central part, 64° to 68°N) at the scale of 1:1,000,000, compiled by P.T. Hanley and O.L. Hughes.

- O.F. 190 *Drift Prospecting Studies* Zinc-lead-silver-rich sulphide float and associated geochemical anomalies found during drift prospecting studies in the Spi Lake area, southeast District of Keewatin, by W.W. Shilts. The file comprises three pages of text and two sketch maps.

- O.F. 192 *Southeast Keewatin — Surficial Geology And Geomorphology Maps* Preliminary drafts of five surficial geology and geomorphology maps and an explanatory legend of part of the southeastern District of Keewatin, comprising Marble Island (55J), Tavani (55K), McQuoid Lake (55M), Gibson Lake (55N) and Chesterfield Inlet (55O) map-areas, compiled by A.N. Boydell and based on field work in 1973. Scale 1:125,000.

## MINES BRANCH

### Responsibilities

Technical and consulting assistance in northern mining, mineral processing, metallurgical, natural gas, petroleum, and coal developments.

### Long-term Plans

To continue its role of technical and consultative assistance and co-operating with the mining and energy industries, the Department of Indian Affairs and Northern Development, and government agencies.

### Review of 1973-74 Operations

#### Mineral Processing

The Construction Materials Section is continuing its investigations on the behaviour of concrete under winter conditions in northern Canada; strength and elastic properties of concrete specimens are to be measured at -40°F and -100°F.

Housing in northern Canada might benefit from using no-fines concrete as a result of its highly suitable mechanical

properties and freeze-thaw resistance which are associated with lower unit weight and higher thermal insulating value.

The use of sulphur concrete in swamp-weights for pipeline development represents one of the possible specialized uses in northern Canada for that material which is undergoing long-term creep tests.

#### Mineral Sciences

In support of Mines Branch work related to northern development, the Analytical Chemistry Section Analysed twenty-one line-pipe steels that involved approximately four hundred determinations of at least twelve different elements.

#### Fuels Research

The Centre made a detailed petrographic analysis of a drill core received from the Teslin coal property in the Carmack area. The results showed this coal to be extremely rich in vitrinite and excellent as a blending coal.

The analysis of two mine air samples from the Northwest Territories contributed to the continuing mine safety program.

#### Mining Research

The Centre initiated an investigation to determine the permafrost distribution in the Clinton Creek Mine, Yukon Territory, and provided the necessary thermistor rings and read-out equipment. The mining company concerned is participating in this program which will continue during the 1974-75 fiscal year.

#### Metals Reduction and Energy

For possible entry into the Japanese market, the Centre made a preliminary evaluation of coal samples originating from the Carmack area of the Yukon Territory.

Long-term interests in northern resources concern the possibility of applying new reduction technology to iron ore of the Snake River (Y.T.) deposits, as yet undeveloped as a result of the remote location. Open-pit technology would be applicable to exploit some five billion tons of iron ore assaying 46 per cent iron and 0.35 per cent phosphorus.

#### Extracting Metallurgy

Interest in northern resources focussed the development of hydrometallurgical methods applicable to ore processing, solution treatment, and corrosion prevention.

There exists in Canada a number of moderate-sized nickel-copper sulphide deposits of insufficient size to support a mining complex. The making and shipping of concentrates from such deposits is wasteful since a high-grade concentrate usually sells in a low recovery, and a low-grade concentrate is expensive to ship. Autoclave leaching of such ores followed by treatment of the leach solution shows the possibility of recovering nickel and copper either in crude or refined condition according to available capital and projected markets. The plant necessary to exploit that type of deposit could be built at mine site, thereby minimizing shipping costs. The principal reagent for the autoclave is oxygen which can be usually produced cheaply on

Corrosion prevention applies to steel balls used for the wet grinding of Canadian ores. The annual cost of grinding balls amounts to approximately \$20 million and results from processing some 200 million tons of ore. Corrosion a partial result of abrasion, is a significant factor. The addition of sodium molybdate to the grinding mill reduced ball wear 50 per cent in laboratory tests made on hematite ore. Preliminary results indicate that corrosion represents a larger part of the total ball wear where non-ferrous metals are employed, than when hematite ore is ground.

#### **Physical Metallurgy**

Activities closely related to northern development are co-ordinated in two major projects, one covering the characteristics of materials and alloys for engineering applications in the Arctic, and the other dealing specifically with oil and gas pipelines.

#### **Metals and Alloys for Use in the Arctic**

A monograph, intended to provide performance and technical data for the design of structures, vehicles and equipment for the North is being prepared. Data on the important characteristics down to -100°F of a wide range of engineering alloys have been collected, and chapters have been completed on particular problems such as welding and fracture toughness.

Fracture toughness is the strength characteristic which is most adversely affected by low temperatures. Basic studies have sought to determine the extent to which the microstructure can be used as a guide to obtaining maximum toughness of alloy steels. Further work has demonstrated that controlled conditions in the processing techniques increased the yield strength of existing steels

by up to 25 per cent and significantly improved the notch-toughness at low temperatures.

Low-maintenance steel structures present practical advantages in remote northern areas. The galvanizing process leads to embrittlement that is being evaluated on structural steels of different strength levels. Tests are being carried out in a marine-type environment on welded or cold-worked samples.

In order to fill an information gap regarding the atmospheric and sea-water corrosion rates of structural metals in the Arctic, a long-term, atmospheric corrosion test site was established at Tuktoyaktuk, N.W.T. close to the ocean, where exposure tests on three steels are in progress. In addition, immersion tests are being carried out in Arctic sea water, near Ellesmere Island.

Transportation difficulties in the North account for the favoured use of high-strength alloys, their higher cost being offset by a reduction in weight. The resistance of selected alloys to environmental cracking is being studied in a simulated marine environment. Investigations to date indicate that 18 per cent Ni (200) maraging steel requires cathodic protection for marine service but is then prone to hydrogen embrittlement. Environmental cracking occurs in HY 140 steel under certain conditions, whereas excellent resistance is offered by Ti-6211.

The study of the notch ductility of welds made by various processes in a standard grade of structural steel plate has confirmed that electrogas welds possessed very high notch toughness at low temperatures. Full-thickness explosion bulge tests will be carried out as soon as a suitable test site becomes available.

#### **Metals and Alloys for Fuel Transmission Pipelines**

The objective of this project is to ensure the structural integrity of oil and gas pipelines in the North in order to minimize ecological damages and to maintain operational efficiency. The first approach involves the assessment of Canadian and foreign-manufactured pipes, and the second, the development of a weldable line-pipe steel of improved strength and toughness.

Nine representative samples of line pipe up to 48 in. diameter, 1.25 in. wall thickness and 40 ft. long, are being examined. Samples recently acquired were manufactured to conform to the tentative specifications for the Mackenzie Valley pipeline, and may

definitely be categorized as candidate pipe. The evaluation procedure includes non-destructive inspection and the investigation of residual stresses, the level and uniformity of the mechanical properties, the microstructure, the seam weld and field weldability, the fracture toughness, the fatigue strength and environmental cracking resistance. The emphasis throughout is on the problem areas associated with the northern environment.

Laboratory-made girth welds exhibited notch ductility properties superior to those of submerged arc seam welds although the latter would be improved by changing the weld consumables. Lowering the ambient welding temperature brought varying response from pipeline steels to cracking susceptibility in the heat-affected zone. This suggests that preheating will often be a necessary part of the welding procedure.

Environmental cracking resistance studies have continued on U-bent strips containing the seam weld, under static loading in an acidified H<sub>2</sub>S bearing solution. All pipeline steels tested to date have shown some incidence of cracking, the heat-affected zone being particularly vulnerable. Similar tests on a typical steel have confirmed that, in the absence of H<sub>2</sub>S, cathodic protection systems should not cause hydrogen embrittlement cracking. Fatigue tests in a salt solution with cathodic protection revealed a significant detrimental effect. At slow cyclic loading speeds the crack growth rate was observed to be about 50 times as fast as at high speeds. Similar effects were found without cathodic protection.

The measurement of toughness and its correlation with service performance are matters of major importance to the integrity of the pipe. Results obtained on five line-pipe steels indicate that the full-thickness drop-weight (DWT) test would have considerable merit as a replacement for the small-scale Charpy test for quality control of the toughness parameter.

The development of higher-strength steel with superior notch toughness is aimed at meeting the requirements of the next generation of northern pipelines. Evaluation of the results from the first experimental heats of a relatively lean alloy, low-carbon steel was quite encouraging although the aging response requires improvement.

Several service failures that occurred in a pipeline of lap-welded construction in the Yukon have been investigated for the National Energy Board, and the reasons for their failure determined and discussed.



Assistance was also given to the Department of Public Works in the preparation of specifications for a welded bridge in northern Ontario.

#### Plans for 1974-75

Research will continue on the permafrost distribution in the Clinton Creek Mine, the strength of concrete at low temperatures, and the characteristics of ball wear in ore grinding.

The preparation of the monograph on metals and alloys for Arctic service will be completed, and the collection of corrosion data for structural alloys in the atmosphere and in sea-water will continue. Studies in progress on line pipe will proceed as formerly, with the addition of cyclic pressurization tests at sub-ambient temperatures on mechanically damaged medium size pipe. This test is intended to simulate service conditions, and a method for producing controlled and repeatable surface damage has been developed.

### RESOURCE MANAGEMENT AND CONSERVATION BRANCH

#### Responsibilities

The Resource Management and Conservation Branch administers and manages the mineral resources underlying Hudson Bay and Hudson Strait. The branch exercises comprehensive statutory authority and full regulatory control over the exploration for, and development of, offshore mineral resources in these as well as in other offshore areas under the jurisdiction of the Department.

The disposition of oil and gas exploration permits and production leases on Canada Lands, both on land and offshore, is governed by the *Canada Oil and Gas Land Regulations*, which were promulgated under the *Public Lands Grants Act* and the *Territorial Lands Act*. Comprehensive statutory authority for controlling all oil and gas operations including the conservation of resources, the prevention of waste and pollution and the safety or personnel is provided for by the *Oil and Gas Production and Conservation Act*.

#### Review of 1973-74 Operations

The major operation conducted in the Hudson Bay and Hudson Strait regions was "Bayquest 73" — a 2,000 mile seismic participation survey by Kenting Exploration

Ltd. The work was undertaken in central areas of Hudson Bay in September and October 1973 by the *M/V Theta*, a Canadian flag vessel.

Acquitaine Company of Canada Ltd. contracted *M/V Theta* to undertake a short sub-bottom survey in the vicinity of the Aquitaine Hudson Walrus A-71 well, which was drilled in 1969, as well as a short-term experimental seismic program using a newly developed low-energy source.

Geophysical Service Incorporated carried out a 500-mile, 3-week seismic survey in Hudson Bay for Shell Canada Limited with the *M/V Hans Egede*, using a special new airgun array.

The total cost of these 1973 programs was about \$2 1/2 million, bringing the cumulative total spent by industry on oil and gas exploration in the Hudson Bay and Hudson Strait regions to more than \$15 million.

#### Operational Plans for 1974-75

Acquitaine Company of Canada Ltd., plans to undertake a multi-million dollar drilling program in the summer of 1974 in central Hudson Bay using a semi-submersible drilling unit of the Pentagone class.

#### Long-term Plans

The Branch will continue to manage offshore mineral resources in those areas of the Canadian North administered by the Department in a manner consistent with the public interest and with special emphasis on:

- safety of human life
- preservation of the environment and prevention of pollution
- protection of marine life
- optimum physical and economic conservation of mineral resources
- optimum return for Canada from these resources
- coordination of offshore mineral resource activities with other users of the offshore
- maintenance of exploration on a continuing and orderly basis.

As of February 1974, there were 621 Canada oil and gas permits covering 38,028,152 acres in the Hudson Bay and Hudson Strait regions under the administration of the Department of Energy, Mines and Resources.

Industry's future oil and gas exploration activities in Hudson Bay will probably be influenced to a large extent by the results of Aquitaine's 1974 drilling program.

### TASK FORCE ON NORTHERN OIL DEVELOPMENT

The Task Force on Northern Oil Development is an interdepartmental group that was established in December 1968 to advise the federal government on all regional and national matters relating to northern oil and gas development. It carries out studies and research and makes recommendations concerning oil and gas exploration, production, transportation and marketing, with particular emphasis on northern oil and gas transportation.

The Task Force is chaired by the deputy minister of Energy, Mines and Resources and includes the deputy ministers of Indian Affairs and Northern Development, the Environment, and Transport, and the chairman of the National Energy Board. It conducts its program through the activities of six committees.

The Pipeline Engineering Committee appraises all matters relating to the construction and operation of oil and gas pipelines in the North. It is concerned with specifications and design standards, construction methods, mode of operation, maintenance and safety features. The Marketing Committee is responsible for assessing the possible effects of northern oil and gas on the energy supply and demand patterns of North America. The Economic Impact Committee assesses the expected impact on the economy of the construction and operation of northern pipelines. It gives attention to the effect on the economy of the large related capital expenditures in terms of employment benefits, regional impacts, trade balance of payments, costs of goods and services, exchange rates and availability of finances. The Transport Committee evaluates transportation and related proposals, including rail, large aircraft, airships and other alternatives to pipeline transportation. It is also involved in feasibility studies of harbours, docking facilities and transportation routes in the High Arctic. The Industrial Supply Committee assesses the capability of the Canadian market and economy to supply the labour, materials and equipment needed for northern pipeline construction and operation. The Environmental-Social Committee is responsible for environmental and sociological studies related to pipeline construction and operation and involves work of sociologists, geologists, geophysicists, cartographers, biologists, specialists in forestry, water resources and wildlife, and other environmentalists. The





solving problems. The annual meeting of the Canadian Council on Surveying and Mapping includes the provincial Surveyors General and Directors of Survey and provides a means of coordinating federal and provincial surveying and mapping programs and exchanging information of common interest. The National Advisory Committee on Control Surveys and Mapping includes representatives from federal and provincial departments, universities and industry and advises the Minister of Energy, Mines and Resources on the coordination of federal surveying and mapping programs and the promotion and coordination of research. The Director of the Branch is also Chairman of the Interdepartmental Committee on Air Surveys and the Branch provides the Secretariat for the Canadian Permanent Committee on Geographical Names.

#### *International Boundary Commission*

##### **Responsibilities**

To provide for the effective maintenance of Canada's international boundary and to determine the position of any part thereof when boundary questions arise.

#### **Review of 1973-74 Operations**

A joint operation, consisting of a Canadian field party and a United States field party, was initiated to recover and mark more permanently the triangulation stations along the Yukon-Alaska boundary. In addition to providing essential control for the boundary, this system of stations, which was installed at high initial cost in the early 1900's, is finding increasing use in resource development at the present time. The work covered an area of approximately 300 miles from the Beaufort Sea to the Yukon River.

#### **Plans for 1974-75**

Field parties from the Canadian and United States sections will attempt to complete the recovery and marking of triangulation stations started along the Yukon-Alaska boundary in 1973.

##### **Long-term Plans**

To carry out the necessary survey and maintenance operations for the effective maintenance of the international boundary in the North.

#### *Topographical Survey Directorate*

##### **Responsibilities**

To produce and maintain topographic maps of Canada for general purposes at scales of 1:250,000 (and larger), appropriate to the needs of administration, urban and resource development, defence and recreation; to provide a national library for aerial photography and remote sensing data, to promote their use and to provide a service for processing and reproduction; to provide technical and administrative support to the Interdepartmental Committee on Air Surveys.

##### **Long-term Plans**

The long term plans of the directorate are:

- to increase substantially the present map coverage of Canada at 1:50,000 scale, with areas of high resource potential being mapped first,
- to revise, where necessary, all published topographical maps.

The work involved in the production of new maps includes the identification of a network of points (spaced at about four-mile intervals) for which the precise latitude, longitude and height above sea-level are determined photogrammetrically. This network will cover all areas of the North and, through it will be used principally for mapping, it may have secondary uses such as the location of mineral claims, property boundaries, etc. The completion of this network will take about five years.

#### **Review of 1973-74 Operations**

During 1973, two new styles of 1:50,000 topographic maps were produced. These were the monochrome line map and the monochrome photomap (see Figures 1 and 2). These maps are being produced for areas of northern Canada where the majority of map users are prospectors, geologists, engineers, etc., who are trained in map reading. There is no degradation in the accuracy or amount of information portrayed on the monochrome line maps, but as only one colour is employed some care is required in the identification of certain features. The photomaps are produced mainly in areas where a minute depiction of ground detail is required. This type of presentation is most useful in geological surveying and in oil and gas exploration.

A total of 27,000 line-miles of aerial photography was flown principally in northern Ontario, British Columbia and the Yukon Territory. Indexes showing the present status of 1:50,000 mapping may be obtained from the Canada Map Office, 615 Booth Street, Ottawa.

#### **Plans for 1974-75**

It is anticipated that about 700, 1:50,000 sheets will be plotted by Topographic Survey during 1974. This figure includes 300 new sheets in northern Canada (mostly lying in the Mackenzie Valley), 300 new editions of southern sheets that needed revising and 100 photomaps (mostly quadrangles in the Mackenzie Delta).

Aerial photography will be obtained for hydro-electric project areas in Quebec, possible pipeline routes in Manitoba and northern Ontario and mineral development areas in British Columbia and the Yukon Territory.

#### *Legal Surveys Division*

##### **Responsibilities**

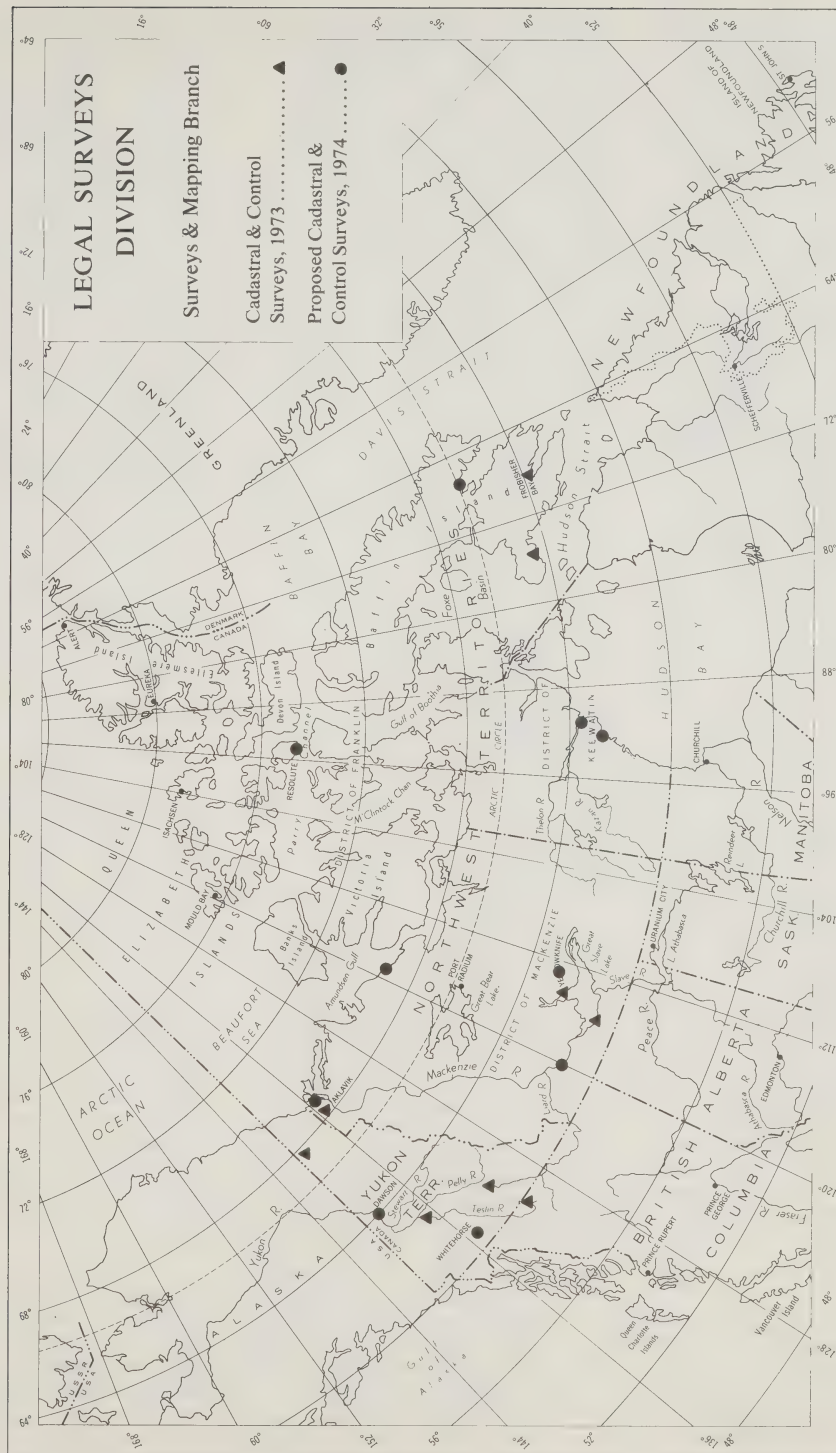
To carry out surveys for land or resource transactions connected with the administration and development of public or other lands.

To ensure the competence of the property surveys, land descriptions and plans made under the Canada Lands Surveys Act and other acts and regulations, and to manage such surveys on request.

To fulfil Canada's federal obligations regarding definition, survey and maintenance of provincial and territorial boundaries.

##### **Long-term Plans**

These are dependent upon the planning and development of other government departments, chiefly Indian Affairs and Northern Development. It is proposed to carry out subdivision surveys in settlements in the North. Similarly, surveys of group lots, camp sites and other parcels will be made along highways as development is undertaken by the Territorial governments. The laying out of lots for airstrips, the location of navigational aids and similar work will be carried out in conjunction with the Ministry of Transport. Coordinate control survey areas will continue to be established in the major settlements in the North. These areas feature an integrated system of permanent reference monuments which can be used to facilitate and correlate all future surveys in these settlements for



engineering, mapping, cadastral and other development purposes. Because of the referencing role of these monuments, extraordinary precautions such as setting markers in cast iron wells beneath city streets are taken to ensure that they will not be disturbed by construction, grading or snow plowing.

### Review of 1973-74 Operations

#### Yukon

A subdivision surveyed for the Government of the Yukon at Haines Junction (96 lots) will be the service centre for Kluane National Park. A 140-mile transmission line was surveyed from Whitehorse through Carmacks to Faro, for the Northern Canada Power Commission. Highway relocation surveys were executed at two locations on the Alaska Highway: between Mile 904 and Mile 928; there were also surveys of relocations of the Canol Pipeline Right-of-Way. Three group lots were surveyed for the Yukon Forest Service at Old Crow, as well as individual lots at other scattered locations. Several lots were surveyed in the city of Whitehorse.

#### Northwest Territories

Subdivision surveys were carried out for the Government of the Northwest Territories at Cape Dorset (142 lots) and at Frobisher Bay (95 lots), to assist the orderly provision of services in those settlements. The survey of the coordinate survey area of Hay River was completed. A major project was control survey along 32 miles of NWT Highway 4, executed for the federal lands office (DIAND), to assist the orderly development of lands adjoining the highway. Small surveys were executed for the Northern Canada Power Commission at Arctic Red River, Fort Franklin, Fort Good Hope, Tuktoyaktuk and Inuvik; and also for the Department of Indian Affairs and Northern Development at Fort Franklin and Aklavik. The survey of a fifty-two square mile parcel at Hay River commenced, for the purpose of description as a proposed Indian Reserve.

#### Plans for 1974-75

##### Yukon

Group Lots will be surveyed for the Yukon Forest Service for radio repeater stations at Beaver Lake and Watson Lake, and for a forest nursery site at Tahkinni River. Subdivisions of cottage lots will be

surveyed for the Department of Indian Affairs and Northern Development at three or four locations on various lakes.

#### Northwest Territories

For the Government of the Northwest Territories, a new townsite (120 lots) will be surveyed at Rolute Bay, additional lots will be surveyed at Pangnirtung (30 lots) and at Rankin Inlet (50 lots), while smaller additions will be made at Chesterfield Inlet and Cape Dorset.

In the Yellowknife Area, the control monuments established along Highway 4 will be extended an additional eight miles into the city.

For the Department of Indian Affairs and Northern Development, the survey of the 52-square mile proposed Indian reserve will be completed, as well as isolated lots at Caen Lake, Grumble Rapid, and Fort Good Hope; a survey of the circumference of Mills Lake, and a road control survey from Highway 4 to Kakiska Lake.

Surveys will be undertaken for the Northern Canada Power Commission at Jean Marie River, Nahanni Butte, Fort Liard, Rankin Inlet and Pangnirtung.

Inuvik presents a special problem for permanent monumentation, and a new technique for placing coordinate control survey monuments will be tried this summer.

#### Directorate of Map Production

##### Responsibilities

The Directorate is responsible for the drafting and printing of maps of the National Topographic Series; the production of small-scale maps, aeronautical charts and flight information publications; the design and production of the National Atlas of Canada; and the provision of cartographic support services to federal and provincial government departments and to private agencies.

#### Review of 1973-74 Operations

The following new or revised National Topographic Series maps, in northern Canada, were printed in 1973-74:

- 69 multicolour maps at a scale of 1:50,000
- 10 multicolour maps at a scale of 1:250,000
- 354 monochrome maps at a scale of 1:50,000
- 163 photomaps at a scale of 1:50,000
- 4 photomaps at a scale of 1:250,000.

In the field of small-scale mapping, a new map of the Yukon Territory at 1:1,000,000 scale was published.

Publication of aeronautical data was maintained, including Visual Pilotage Charts, Enroute Charts, Enroute Supplement, and Canada Air Pilot. The Northern Supplement, a new publication, was produced to consolidate aerodrome, radio aid and flight procedural data in the Arctic.

Publication of the Fourth Edition of the National Atlas of Canada in loose sheet form, English and French editions, was completed.

#### Plans for 1974-75

Revised editions of the Map of Northwest Territories and Yukon Territory, scale 1:4,000,000, and of the Map of Northwest Canada showing transportation facilities, at 50 miles to one inch, are scheduled for publication.

Cartographic services for other agencies include:

- a topographic map of Northern Ellesmere Island at 1:1,000,000 scale
- a map of Northwest Canada showing timber reserves, at 50 miles to one inch.

#### Long-term Plans

Long term plans with regard to northern mapping are to assist in the publication of National Topographic Series maps, to maintain production of small-scale maps and up-to-date aeronautical documents, to publish the National Atlas on a 10-year cycle, and to provide cartographic assistance to other governmental agencies engaged in northern activities.

#### Geodetic Survey of Canada

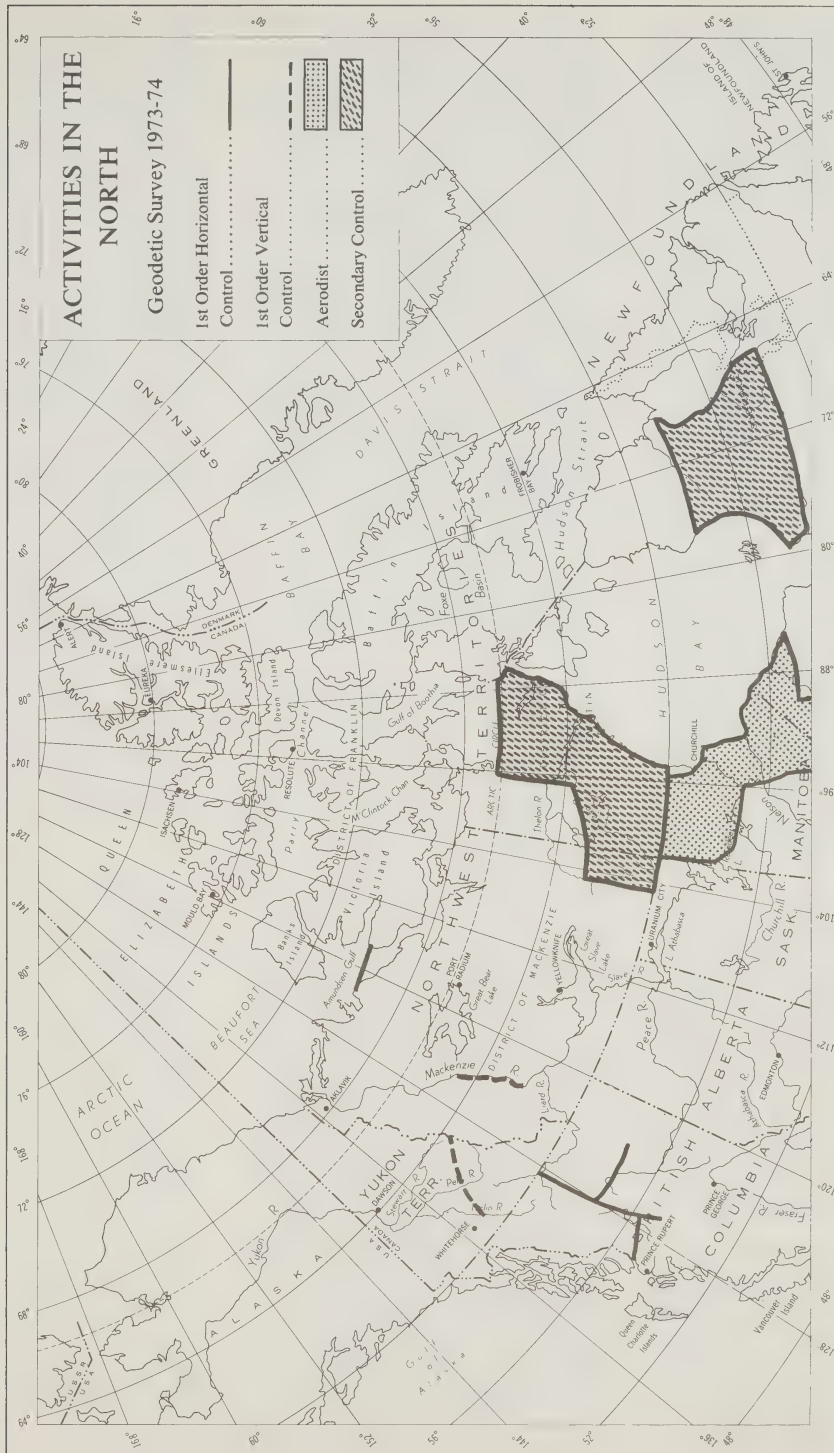
##### Responsibilities

The Geodetic Survey is responsible for providing a framework of precise horizontal and vertical control, and for providing the lower-order control survey fabrics and special surveys required for other government agencies, industry, environmental studies, engineering and geosciences, national security, the national mapping program and the orderly development of the North.

#### Long-term Plans

Long term plans for operations in the North include the extension, densification and improvement of the precise horizontal and vertical control frameworks, the improvement and extension of the existing





lower-order fabrics, and the provision of control for the 1:50,000 mapping program in areas still unmapped at that scale.

### Review of 1973-74 Operations

The highway levelling program in the Yukon Territory continued, and a new first-order level line was established from Johnson's Crossing through Ross River to MacMillan Pass.

In the Northwest Territories, the Mackenzie River level line was extended north from the vicinity of Fort Simpson to the Blackwater River. In Keewatin, the existing lower-order horizontal control fabric was improved and extended, and detailed horizontal control provided for the 1:50,000 mapping program. In the Amundsen Gulf area, a precise baseline was established by Doppler satellite methods to assist a Marine Sciences Branch, DOE, study of over-ice wave propagation.

In northern British Columbia, first-order traversing was carried out to strengthen and increase the density of the existing first-order framework.

In northern Ontario and Manitoba, the remaining gaps in the Aerodist coverage were completed and altimeter traversing was carried out to strengthen existing vertical control for the 1:50,000 mapping program.

In northern Quebec, the existing lower-order control fabrics were strengthened and vertical control for the 1:50,000 mapping program was established by altimeter traversing.

### Plans for 1974-75

Highway levelling will be continued in the Yukon Territory. The Alaska Highway line from Johnson's Crossing to Whitehorse will be re-levelled, and new levelling is planned for Highway 9 from Faro to Carmacks, and on Highway 3 from Stewart Crossing through Dawson to the Alaskan border.

In the Northwest Territories a major project will be carried out to establish a highly accurate network of Doppler satellite stations throughout the Arctic Islands; four stations will also be established on the coast of Greenland in cooperation with Danish authorities. This new framework will replace the old Shoran network and provide a basis for improvement of the existing horizontal control fabric throughout the area. The position of Greenland, relative to the Canadian Arctic Islands, will be accurately determined.

The Mackenzie River levelling project will be speeded up by the addition of a third levelling unit. It is anticipated that the line will reach the vicinity of Arctic Red River in 1974. In the eastern part of the District of Mackenzie and the western part of the District of Keewatin, the existing lower-order survey fabrics will be extended and improved, and horizontal control will be provided for the 1:50,000 mapping program. Control for the 1:50,000 mapping program in the proposed eastern natural gas pipeline corridor will be completed on the mainland, Boothia Peninsula and Somerset, and Cornwallis and Bathurst Islands.

In northern British Columbia, a new first-order traverse will be extended north from Prince Rupert through Stewart to connect with the existing control on the Alaska Highway. Connections will be made to US National Geodetic Survey control in the vicinities of Wrangell and Juneau, Alaska, and to the 1973 traverse to the east.

In northern Manitoba, a new first-order level line will be established between Notigi and Lynn Lake, and re-leveling will be carried out in the vicinities of Flin Flon and The Pas.

In northern Quebec, a new first-order level line will be started eastward from Fort George; this line will ultimately connect with existing control near Schefferville.

## POLAR CONTINENTAL SHELF PROJECT (PCSP)

### Responsibilities

To do a long-term study of the continental shelf lying north of the mainland of Canada and north and west of the Canadian Arctic Archipelago, including the sea floor, the earth's crust, the mantle beneath it, and the waters above it; together with the islands of the archipelago, the straits and sounds between the islands and, where relevant, the adjacent mainland. The study covers mainly those fields of survey and research for which the Department of Energy, Mines and Resources is responsible in other parts of Canada, wherever such study is not more economically and efficiently pursued as a separate self-contained operation. It is also designed to include or to support worthwhile research in fields outside those normally covered by the Department if such research is in the national interest and could not otherwise be done. An important function of the PCSP is to co-ordinate and arrange for mutual or concerted action by

various agencies whose diverse specialities and capabilities can be brought to bear on different but related aspects of a major Arctic problem or critical area of study; and to provide continuity of planning and operation for various studies which are short term and focussed on individual problems. Emphasis is placed on field research and survey, but basic laboratory or theoretical research is carried out as needed to aid in the investigations, or in the interpretation of field data; and equipment or technique development or experimentation is undertaken when relevant. In addition, the field activities of the project are made available, under certain conditions, to approved university and other non-government research groups.

### Long-term Plans

Field surveys and research will eventually cover the Canadian sector of the arctic continental shelf of North America, those parts of the Arctic Ocean basin that are of interest to Canada, and those parts of the Arctic Archipelago and arctic mainland of interest to the Department of Energy, Mines and Resources, and not investigated by other agencies. It is intended that program co-ordination and support logistics of the project shall be made available, where appropriate and approved, to scientific activities of interest to the government of Canada in any part of arctic Canada or the adjacent oceans.

### Review of 1973-74 Operations

Major field work was co-ordinated from mid-February to mid-October from Tuktoyaktuk in the Mackenzie Delta and from Resolute Bay on Cornwallis Island.

Several major programs at times extended the PCSP base camp facilities at both Tuktoyaktuk and Resolute. The major field programs were the regional gravity and hydrographic project in Amundsen Gulf and the hydrographic survey of Norwegian Bay. Progress was made in the definition of permafrost through various geological and geophysical projects. The considerable scope of projects concerned with biology and ecology will be noted in the projects described below. Several projects were undertaken preliminary to the Beaufort Sea Study of 1974. Of particular note is the use of the weather satellite recording station at Resolute. A total of 65 diverse projects were supported by the Polar Continental Shelf Project in 1973.

In addition to the Department of Energy, Mines and Resources, the following agencies are involved in, or received assistance from, the 1973 program of the Polar Continental Shelf Project:

Environment Canada, Fisheries and Marine  
 Environment Canada, Lands, Forests and Wildlife  
 Environment Canada, Marine Sciences Directorate  
 Environment Canada, Water Management  
 Environment Canada, Environmental Management  
 Department of Indian Affairs and Northern Development  
 Department of National Defence, D.R.E.P.  
 National Museums of Canada  
 National Research Council — Canadian Committee for the International Biological Program  
 Quebec Wildlife Service  
 Carnegie Museum of Natural History  
 Scott Polar Research Institute  
 Vancouver Public Aquarium  
 University of Alberta  
 Adelphi University  
 University of British Columbia  
 Memorial University of Newfoundland  
 McGill University  
 University of Minnesota  
 University of Ottawa  
 Swiss Federal Institute of Technology  
 Texas Tech University  
 University of Tübingen

The following is a summary of work done in 1973 by the Polar Continental Shelf Project or to which the project contributed. In several cases, as noted, the project provided logistical or field support to studies of other agencies; these studies will be described in greater detail in those reports submitted by the various agencies responsible for their scientific direction.

**Biology:** Shoran Lake, Banks Island  
 Investigator: H. Müller-Beck, Tübingen University  
 An excavation at Umingmak near Shoran Lake first developed in 1970 was re-entered in 1973. More than 5,000 archaeological objects have been mapped on a scale of 1:5 as well as 20,000 animal remains. The data from the Pre-Dorset site (about 3,800 years old) allow reconstruction of the sedimentation of the remains which was especially rapid near the slope of Signal Hill. Valuable data have been collected for comparison

with similar fossil ice-age sediments in Europe. Some stone tools and bone implements, such as a toggle harpoon and some ornamented objects with animal engravings, are interesting and remarkable discoveries.

**Biology: International Biological Program: Tundra Ecosystem Study,** Truelove Lowland, Devon Island

Investigator: L.C. Bliss, University of Alberta

The fourth and final field season of this high arctic ecosystem study was conducted from April to September, 1973. A party of six scientists had overwintered the previous winter to study muskox activity and meteorology. Fourteen individual studies were supported in the area by Polar Continental Shelf Project aircraft; these studies included meteorology, hydrology, soils, limnology, botany, zoology and ornithology.

**Biology: Entomology, mites,** Tuktoyaktuk

Investigator: R.W. Strandtmann, Texas Tech University

The fauna in the Tuktoyaktuk region are similar to that of the Barrow area in Alaska. Of particular interest was finding the red spidermite, *Bryobia*, which was found only under rocks although it is a plant feeding mite. Two distinct species of *Bryobia* were found in the area, one of them definitely being a new species. Some samples of mites were also collected by the archaeology party at Shoran Lake on Banks Island.

**Biology: Vertebrate Ethology, Animal Community Study,** Bathurst Island

Investigator: S.D. MacDonald, National Museum of Natural Sciences

Most of the projects are continuous since 1968. Some may become temporarily inactive when the species under study is present in very small numbers, does not breed, or is absent. Amongst the studies of 1973 were the following: floral and faunal surveys in various areas, breeding and nesting behaviour of red phalarope, census of 35 different bird species, ecology of muskoxen and lemming, meteorology in the station area. The continuing studies emphasize the arctic animals in their undisturbed natural environment and the research area is being proposed as a wildlife preserve by the tundra panel of the International Biological Program.

**Biology: Marine, Beluga,** Eastern Arctic

Investigator: J.D. Heyland, Quebec Wildlife Service

Concentrations of whales were photographed in Elwin Bay, Somerset Island, at Cap Kater, Baffin Island, in Maxwell Bay, Devon Island, and in Prince Regent Inlet 35 miles north of Cape Kater. Photographs were taken with a Williamson Eagle IX aerial camera mounted vertically in a single Otter aircraft under charter to PCSP. Vertical aerial photographs provide an accurate and permanent census of these populations. In addition to total counts, it is possible to determine other biological parameters such as age ratios within the herds and aspects of group and individual behaviour.

**Biology: Marine, White Whales and Bowheads,** Beaufort Sea

Investigators: D.E. Sergeant and W. Hock, Environment Canada, Fisheries and Marine

During late July, 1973, about 4,000 white whales and 20 bowhead whales were observed from Herschel Island to Cape Parry with the main concentration being in the Delta. Observations were made from a PCSP chartered helicopter. A second survey in mid-September located migrating bowheads, but no white whales moving west along the Delta coast.

**Biology: Marine, White Whales and Narwhals,** Lancaster Sound

Investigator: D.E. Sergeant, Environment Canada, Fisheries and Marine

Lancaster Sound is an important centre for white whales, over 10,000 animals being counted during several flights in early August. Concentrations numbering up to 1,500 were generally associated with the mouths of small streams flowing off plains and therefore warm (about 10°C). Surveys in deep fiords revealed no white whales in the mouths of cold streams. The hypothesis is upheld that white whales in summer concentrate in stream mouths for calving. Narwhals were seen chiefly in Admiralty Inlet, and no movements to stream mouths have been demonstrated. The species must calve in cold water.

**Biology: Marine, Narwhal,** Eastern Arctic

Investigator: P. Dow, Vancouver Public Aquarium

Studies have been conducted on the tusk of the narwhal to determine its nature and origin. The tissue acquired in 1973 shows



the main cells of the tusk. Autopsies, however, have raised the question as to how many narwhals with tusks are male and how many are female, since one with a tusk this season was proven to be a female (with ovaries, that is). Only "tuskers" are being hunted at present so that this information may affect future legislation and hunting habits.

*Biology: Ornithology, Anderson River*

Investigator: T.W. Barry, Canadian Wildlife Service

The breeding biology of white-fronted geese was investigated. Approximately 2,500 birds were banded in a continuing study of distribution and migration of waterfowl. About 1,000 snow geese were also dyed yellow to assist pipeline study groups investigating the post-nesting distribution of these birds along the North Slope during September. PCSP supported this project by helicopter and radio.

*Biology: Ornithology, Greater Snow Goose, eastern Arctic*

Investigator: J.D. Heyland, Quebec Wildlife Service

Severe weather conditions in any one year do not seem to affect the distribution of these birds. Previous indications that the snow goose population is divided into at least six subsections have been substantiated. Also, there is very little interchange between the northern and southern sections of the population. The Bathurst Island population is isolated. PCSP supported this program through use of aircraft.

*Biology: Zoology, Polar Bear Research, Beaufort Sea*

Investigator: I. Stirling, Canadian Wildlife Service

Research to date has shown that: great annual variation exists in the seasonal distribution and abundance of polar bears; few Beaufort Sea bears spend summer on land; seals constitute almost the entire diet; most maternity denning occurs on Banks and Western Victoria Islands; maternity denning of polar bears in the multi-year pack-ice of the polar basin remains unfirmed; seasonal movements of individual bears may encompass several hundred miles; some travel between Alaska and Canada; the polar bear population appears to be substantial although total numbers cannot be estimated yet. This research has been supported by aircraft of PCSP.

*Biology: Zoology, Ringed Seals, Western Arctic*

Investigator: T.G. Smith, Environment Canada, Fisheries and Marine

Travelling by dog-sled, it was possible for the first time to evaluate the density of ringed seal birth lairs in flat and pressured ice areas. A surprising high incidence of predation of the seal pups by fox was found. Preliminary studies were begun on the heat budgets of hauled-out ringed seals. One ringed seal marked at Herschel Island in 1971 was shot south of Holman Island in 1973. PCSP aircraft supported this study.

*Climatology: North Water-Baffin Bay Project, Baffin Bay and Smith Sound*

Investigator: F. Muller, Swiss Federal Institute of Technology

The wintering (1972-73) stations on Carey Island and Coburg Island continued to acquire the following data: climatological observations every six hours; continuous measurement of radiation; maintenance of four automatic weather stations; sampling of air humidity for isotope analysis every 24 hours; and weekly observations of sea ice. Another station was set out at Cape Herschel. Daily launchings of radiosonde equipment began in June, 1973. PCSP provided logistical support to this project through equipment and aircraft. All three stations have been manned by four people each during the winter of 1973-74.

*Geology: Bedrock, Banks Island*

Investigator: A.D. Miall, Geological Survey of Canada, EMR

All the main outcrops of the Devonian to Tertiary strata in the project area were visited and some progress was made towards a new geological map of the region. Emphasis in the 1973 field season was on detailed measurements of stratigraphic sections, collections of samples for petrological and grain size studies, and measurements of sedimentary structure orientations to enable reconstruction of paleocurrent patterns to be made. This mapping program was supported by PCSP aircraft.

*Geology: Geomorphology, Mackenzie Delta*

Investigator: J.R. Mackay, University of British Columbia

Field studies were continued on Tuktoyaktuk Peninsula, Richards Island and Garry Island. A map of mean annual permafrost ground temperatures based upon measurements at a depth of 50 feet (approximate depth of zero

annual temperature change) has been prepared. Other studies include processes involved in ice segregation and the growth and thaw of ice-wedges. Water quality analyses are being carried out for numerous drill hole specimens to depths of 200 feet to learn more about past freezing processes. Ice fabric studies of various ground ice types are also being conducted. PCSP has supported these studies through aircraft and facilities at Tuktoyaktuk.

*Geology: Geomorphology, Eastern Banks Island*

Investigator: H.M. French, University of Ottawa

Natural and man-induced thermokarst processes were investigated on eastern Banks Island. Ground-ice slumping is probably the most dominant and widespread thermokarst process. Seven holes were drilled in a north-south transect of the disturbed and undisturbed terrain adjacent to the airstrip at Sachs Harbour. Complete logistical support was given by PCSP.

*Geology: Palaeontology: Beaufort Formation, Western Arctic*

Investigator: J.V. Matthews, Geological Survey of Canada, EMR

The late Tertiary Beaufort Formation yields an abundance of well preserved insect fossils which provide information on both the late Tertiary environment of northernmost Canada and the history of the Holarctic insect fauna. PCSP has airlifted the scientists to Ballast Brook (northern Banks Island) and to Meighen Island to collect samples. The Beaufort sediments at the latter location are much richer in fossil insects. Plant fossils from the Beaufort sediments include those of trees now occurring well south of the tree line. The peats are probably of middle-to-late Pliocene age. The insect fossils indicate a taiga environment somewhat like that now existing some 800 km. to the south. A few species presently have a very restricted range in North America.

*Geology: Palaeontology: Eureka Sound Formation, Ellesmere Island*

Investigators: Mary R. Dawson, Carnegie Museum of Natural History and R.M. West, Adelphi University

The expansion of the palaeobiology knowledge of the Eureka Sound Formation necessitates some new interpretations of this rock unit. Much of it was deposited in an open-water marine environment with the

physical nature of the sediment suggesting varying depths and distances from shore. Also, numerous occurrences of both animals and plants indicate the presence of freshwater and probably terrestrial environments interspersed with the marine beds. The existence of terrestrial vertebrates during the Eureka Sound time is not denied because the previous presence of freshwater sediments does not preclude their existence.

*Geology: Coastal Sedimentary Processes, Tuktoyaktuk Peninsula*

Investigator: C.P. Lewis, Geological Survey of Canada, EMR

Data on sediments and sedimentary processes between Kittigazuit and Cape Dalsius include the nature and distribution of shore features, nearshore bathymetric and bottom profiles, bottom sediment samples, cross-sections of shore features, shore feature sediment samples and stratigraphic and frost table locations. All field work was conducted out of PCSP facilities at K and Atkinson Point. The recessional thwest coast of TUK Peninsula is deeply bayed due largely to breaching of thermomast lakes. Local rates of retreat are greatest where coastal cliff sediments contain considerable pore, wedge or massive ice. The general direction of longshore drift along K Peninsula is to the northeast, largely under control of discharge from the East channel of the Mackenzie River. The active shore in active coastal deposits seldom exceeds 1 metre in thickness, but the frost table appears to drop sharply at the shoreline.

*Geology: Stratigraphy: Silurian-Devonian, Somerset Island*

Investigator: O.A. Dixon, University of Ottawa

Stratigraphic sections of Silurian carbonates were examined at Port Leopold on Somerset Island; these rocks previously referred to as Read Bay Formation, represent completely different sedimentary facies and warrant a new formation status. Marine limestones of the Read Bay Formation elsewhere on Somerset Island were studied for depositional environment and for fossil-facies relationships. These and earlier projects on the Read Bay Formation are documenting and interpreting the regional changes in stratigraphy, sediments, fossils, and paleogeography in the Boothia Arch region.

*Geology: Stratigraphy: Quaternary, Arctic Coastal Plain*

Investigators: V.N. Rampton and J.B. Dugal, Geological Survey of Canada, EMR

The quaternary stratigraphy from Nicholson Point to Malloch Hill was examined and critical sections along the Eskimo Lakes were re-examined. Markers set out in 1972 were resurveyed to determine geomorphic process, particularly surficial movement. Logistic support was supplied by PCSP.

*Geology: Surficial, Central Ellesmere Island*

Investigator: D.A. Hodgson, Geological Survey of Canada, EMR

Maps portraying texture and genesis of surface materials, active and inactive geomorphic processes, and ground ice content are in preparation. Substantial areas of Pleistocene deposits are present in the survey area. Solifluction, the most widespread geomorphic process, is active from late May through June. Surface observations and coring were undertaken at the old Eureka airstrip, at the Gemini drill site and near Slide Fiord. A late-glacial re-advance in central Ellesmere Island was delimited and dated. PCSP supplied logistical support.

*Geophysics: Electrical and electromagnetic, Tuktoyaktuk*

Investigator: W.J. Scott, Geological Survey of Canada, EMR

A test area has been established about 15 miles east of TUK. Various instruments have been tested and experiments conducted at this site; some of these are: DC resistivity profiling and sounding, radiowave measurements using Geonics EM-16R and Barringer ground E-phase, pulse-radar, and airborne E-phase in the VLF, LF and broadcast bands. The VLF data in particular appears to reveal thickness of permafrost. PCSP supported this project to complete logistics.

*Geophysics: Gravity, Amundsen Gulf*

Investigator: W.E.F. Burke, Earth Physics Branch, EMR

Gravity and hydrographic readings were obtained at 747 stations on the ice of Amundsen Gulf and 27 gravity stations were re-occupied on Banks Island. A gravity range was also established in the Gulf for the calibration of the surface meter aboard C.S.S. *Parizeau* in the summer. PCSP provided all logistical support for this project.

*Geophysics: Geothermal Studies, Arctic Archipelago and Mackenzie Valley*

Investigator: A. Judge, Earth Physics Branch, EMR

Permafrost thickness determinations are available for 19 sites in the Arctic Islands, 22 deep sites on the mainland and 17 shallow sites along the Mackenzie Valley. To investigate local variations in permafrost distribution and the effect of shorelines, measurements have been made of underground temperature and thermal properties of the rocks of 11 sites on- and off-shore of Little Cornwallis Island, N.W.T. in conjunction with Cominco Ltd. A similar programme of on- and off-shore measurements in the vicinity of the Mackenzie Delta has also been commenced using wells provided by Shell and Gulf Oil for on-shore measurements and a thermal gradiometer probe for off-shore measurements. The Arctic locations and those in the TUK area have been visited through PCSP support.

*Geophysics: Aeromagnetism, Amundsen Gulf*

Investigators: P. Sawatzky and P.J. Hood, Geological Survey of Canada, EMR

About 2,500 line miles were surveyed over Amundsen Gulf and Darnley Bay by a digital-recording rubidium-vapour magnetometer in a Queenair B80 aircraft. Excessive diurnal variations terminated the survey.

*Geophysics: Seismic refraction, Mackenzie Valley and Delta*

Investigator: J.A. Hunter, Geological Survey of Canada, EMR

A total of 650 seismic refraction records were obtained near Fort Simpson, Norman Wells and Tuktoyaktuk using an RS-4 12-channel seismograph. Seismic velocities and attenuation rates of first arrivals of energy were computed. Correlation with resistivity data should allow a definition of the permafrost boundaries, detection and mapping of ice lenses and an estimation of permafrost thickness. PCSP provided logistical support in part.

*Geophysics: Seismic, Marine, Mackenzie Delta*

Investigators: J.A. Hunter and R.L. Good, Geological Survey of Canada, EMR

Shallow marine seismic refraction profiles were shot from the *M.V. North Star* of Herschel Island in the Mackenzie Delta. Others were obtained in very shallow water using a suitable smaller vessel. The top of the permafrost is associated with higher seismic velocities and the areal extent of permafrost can be mapped. PCSP offered logistical support to this project.



*Geophysics: Seismic, Refraction, Sverdrup Basin*

Investigators: G.D. Hobson and A. Overton, Geological Survey of Canada, EMR

Seismic refraction data pertaining to the attitude and thickness of sediments within the Sverdrup Basin were obtained over 120 miles. Gravity data at intervals of 4,800 feet were obtained over the same profile. Crustal refraction data were recorded at Grosvenor Island, King Christian Island and Eureka. Reversed profile techniques will define seismic velocities and delay times related to structural geology.

*Geophysics: Weather Satellite Receiving Unit, Resolute Bay*

Investigator: S. Washkurak, Geological Survey of Canada, EMR

A small portable APT system to receive weather satellite data over the entire North American continent including the Arctic Islands has been developed and operated at Resolute Bay. Imagery from ESSA8 and NOAA II satellites has been received. Every satellite orbit can be received at this latitude with a composite image showing the entire Arctic region including the Great Lakes and Siberia. PCSP supplied man years, equipment and all logistical support.

*Geophysics: Magnetic and Gravity, Marine, Amundsen Gulf*

Investigator: D.L. Tiffin, Geological Survey of Canada, EMR

During July-September, 1973, C.S.S. *Parizeau* was instrumented with magnetometer and gravimeter in a joint DOE-EMR geophysical-hydrographic survey in Amundsen Gulf. Magnetic base stations were deployed at Pearce Point and Sachs Harbour. A total of 18,035 kms. of magnetic data were acquired. A good quality magnetic map of the area can be compiled despite the high geomagnetic latitude. A geomagnetic variation anomaly extends across the Beaufort Sea continental shelf and possibly west of Banks Island. PCSP provided logistical support.

*Geophysics: Decca Phase Lag Tests, Amundsen Gulf*

Investigator: D.H. Gray, Environment Canada, Marine Sciences Directorate

In April and August of 1973, a phase lag comparison test was achieved using a double monitor system with the hyperbolic Decca chain operated by PCSP in Amundsen Gulf. The test compared the effect of sea ice and sea water on the secondary phase lag. The

theoretical secondary phase lag calculations of J.R. Johler are again confirmed for sea water. It is also confirmed for sea ice conditions if the conductivity of the surface ice and snow considered rather than of the sea water which is under the ice.

*Glacier Physics: Devon Ice Cap*

Investigators: W.S.B. Paterson and R.M. Koerner, Polar Continental Shelf Project, EMR

A complete core was recovered from a borehole 299 metres deep. Dating of the core will be done by  $\text{CO}_2$ ,  $\text{Si}^{32}$  and pollen analyses. Inclination, diameter, vertical strain rate and temperature were measured in the 1971 and 1972 boreholes and surface strain networks were remeasured. The 1971-72 mass balance of the northwest side of the ice cap was found to be  $+102 \text{ kg m}^{-2}$  per year.

*Glaciology: Radio Echo Sounding, Devon Ice Cap*

Investigator: G. de Q. Robin, Scott Polar Research Institute England

Systematic radio echo sounding was carried out over the eastern section of the PCSP stake network. Data are being analysed to check applicability of standard radio theory to bedrock echoes to see if differing areas of bedrock show differing character in their returns and to give accurate figures of absorption losses in ice from field data. Comparative studies of bottom fading were made at 60 mHz and 440 mHz. The latter equipment was also used with a phase sensitive receiver to accurately measure velocity of radio waves in the ice.

*Glaciology: Photogrammetry and Aerial Photography, Mackenzie Valley and Arctic Archipelago*

Investigator: K. Arnold, Environment Canada, Environmental Management

The Twin Beechcraft of PCSP continued to fly selected areas for photography. The Mackenzie River was flown at break-up time. Other areas were flown for snow goose census and to add to the determination of mass balance of selected small ice masses to study regional glacier/climate interactions.

*Hydrography: Amundsen Gulf*

Investigator: E.B. Clarke, Environment Canada, Water Management

Between August 1 and September 15, 9,807 nautical miles (n.m.) of sounding, 9,738 n.m. magnetic profiles, 9,807 n.m. gravity profiles

and 226 n.m. seismic profiles were obtained aboard C.S.S. *Parizeau* operating in Amundsen Gulf and navigating with the PCSP Decca chain.

*Hydrography: Amundsen Gulf*

Investigator: H.W. Pulkkinen, Polar Continental Shelf Project, EMR, seconded from Marine Sciences Directorate, DOE

Bathymetric soundings were taken at every gravity station observed in Amundsen Gulf. Navigation over the 6 km grid was executed using the PCSP Decca chain. The northern half of Amundsen Gulf was surveyed in 1973. Aircraft support was supplied by PCSP.

*Hydrography: Norwegian Bay*

Investigators: M. Crutchlow and A. Mortimer, Environment Canada, Marine Sciences Directorate

The sounding area covered Norwegian Bay from a base camp at Surprise Fiord. One 208 and one 206 helicopter, each with fixed wing support, were used and navigated under a Motorola R.P.S. System. PCSP provided aircraft and logistical support.

*Meteorology: Atmospheric Refraction Studies, Alert*

Investigator: G.W. Johnson, University of Minnesota

Atmospheric refraction measurements were made at Alert at the PCSP base camp during September, 1973. The project is an attempt to establish a more definitive basis for predicting and ascertaining the results obtainable from polar astro-navigation and primarily concerned with low altitude solar observations. A correlation of radiosonde refraction with observed refraction and with standard refraction tables will result.

*Oceanography: Undersea Ice Acoustics, Barrow Strait*

Investigator: J.H. Ganton, Defence Research Establishment Pacific

During 1973, field work was concentrated in Barrow Strait and was concerned with measurement of underwater sound to establish the environmental parameters which would affect the performance of sonar. Measurements were made of sound transmission and of signal-to-noise ratio versus depth. Ambient sea noise was also measured. PCSP supplied logistical support.

*Oceanography: Tidal Studies, Beaufort Sea and Amundsen Gulf*



Investigator: W.J. Rapatz, Environment Canada, Water Management  
 tide-and-water-level gauging stations are established to expand and update tidal information in the Beaufort Sea — Amundsen Gulf area and to support the hydrographic survey of *C.S.S. Parizeau*. Also, two all-year stations were established at Herschel Island and Cape Bathurst. PCSP contributed considerable logistical support.

*Topics: Corrosion of Metals, Tuktoyaktuk*  
 Investigator: G.J. Biefer, Mines Branch, IR  
 Tests were conducted at the PCSP base camp at TUK to determine corrosion rates in the atmosphere and sea-water of the Arctic. Specimens of three different structural steels were deployed for exposure.

*Ice: Dynamics of first year ice, Mackenzie Delta area*  
 Investigator: P.F. Cooper, Jr., Polar Continental Shelf Project, EMR  
 No strain gauges were set out near Pauline Bay, Herschel Island, but short-term variations could not be measured. In the course of the winter, however, the circle determined by the initial position of the markers deformed into an ellipse with major axis oriented SW-NE or approximately perpendicular to the direction of the prevailing winds. This effect may be flow caused by average strain on the ice cover. PCSP support this project with aircraft transport supplies.

*Ice: Area Surveys, Arctic Archipelago, Arctic Ocean*  
 Investigator: D.G. Lindsay, contractor to Polar Continental Shelf Project, EMR  
 Good weather throughout the season allowed the systematic airborne sea ice reconnaissance surveys in the channels of the Arctic Archipelago to proceed very favourably. Break-up in 1973 was earlier than usual so that by mid-September only Sverdrup Channel remained unbroken. Also, the extent of open water in 1973 was much greater than usual. Many small ice island remnants, the remains of T1, were spread in the southern part of McClintock Channel.

*Ice: Strain Measurements, T3 (Fletcher's Island)*  
 Investigator: G. Holdsworth, Environment Canada, Environmental Management

A laser interferometer was used to measure the strain rate on the surface of T3. The preliminary strain rate data obtained over 50 and 100 metre line lengths indicates that predominantly compressive stresses were acting in the general direction of the line throughout the measurements. Superimposed on the compression were cyclical strain oscillations one of which had an average period of about 35 seconds. Personnel and equipment were flown to T3 by PCSP aircraft.

Support was also provided for:  
 a marine ecology and an oceanographic study in the Eskimo Lakes;  
 a study of the linguistic history of place names of certain communities and physical features along tributaries of the Mackenzie River;  
 surficial geology and geomorphology of Melville Island;  
 a coastal erosion — sedimentation study, southeast Melville Island and western Byam Martin Islands;  
 a surficial (to 8 metres depth) drilling and coring program at several locations;  
 location of a Doppler Satellite base bordering Amundsen Gulf;  
 hydrologic studies in the Mackenzie Delta;  
 construction of a single-component, thermistor current meter;  
 development of instrumentation to detect the tilt of the ocean ice surface;  
 a study of the effects of tracked vehicles on high arctic tundra;  
 a study of the effects of the construction, operation and maintenance of northern pipelines on arctic aquatic ecosystems;  
 an evaluation of the regional energy balance for the water-island complex in the Arctic Archipelago;  
 the Arctic Land Use Research (ALUR) program.

#### Plans for 1974-75

Regional and systematic surveys in gravity and hydrography will continue in Amundsen Gulf and Eureka Fiord. The increased emphasis of 1973 on the studies of terrain and the physical environment as these pertain to pipeline development in the Mackenzie Valley and the Arctic Islands will be maintained in the 1974 field season.

Considerable activity will be centered on the base at Tuktoyaktuk as the Beaufort Sea Study Program is co-ordinated out of that

base. The Decca navigation system will be moved from the Amundsen Gulf configuration in May to the Beaufort Sea to facilitate that major study. The base camp at Resolute has been expanded to handle the new level of activity in the eastern Arctic. The North Water Project is entering a critical year in 1974 and will be supported to a considerable extent by PCSP. A considerable program of geology and geophysics will be supported out of Resolute.

The 1974 program will involve an estimated 400 persons, a considerable increase due largely to the Beaufort Sea Study Program. Air transport will be provided by one Bell 205A helicopter, four Bell 206B helicopters, one DHC-3 Otter, one DHC-6 Twin Otter and one Beechcraft D-18S. The ground transport fleet has been increased also. The Pandora, the Theta and the Pressure Ridge will operate in the Beaufort Sea and will be supported logistically and by the Decca chain. In addition to the major base camps at Tuktoyaktuk and Resolute, the Polar Continental Shelf Project will operate camps at Herschel Island, Hooper Island, Atkinson Point, Baillie Island, Cape Parry, Cape Bering, Sachs Harbour, Bathurst Island, Eureka and King Christian Island.

## DEPARTMENT OF THE ENVIRONMENT (DOE)

Effective January 1, 1973, the Department of the Environment was reorganized to respond more effectively to its responsibilities based on the experience of its first 18 months of existence.

Two missions of the Department, the Atmospheric Environment Service and the Environmental Protection Service remain unchanged.

Fisheries and Marine Service, the former Fisheries Service, has assumed responsibility for ocean-oriented activities, while the Environmental Management Service had taken over the national responsibility for inland waters together with those responsibilities related to lands, forests and wildlife.

Support functions including policy, planning, research, finance, liaison, co-ordination, and administration are now integrated under the new Planning and Finance Service.

In summary, as a result of reorganization, the Department of the Environment is now comprised of five Services: Atmospheric Environment, Environmental Protection, Environmental Management, Fisheries and Marine, and Planning and Finance. This reorganization is reflected in the presentation of the following material.

### Responsibilities — General

Environment Canada is responsible for leadership at the national level in the management of renewable resources and the protection and enhancement of environmental quality. Its roles might be summarized as follows: in co-operation with appropriate agencies, to provide a national voice of knowledge and information on the natural environment and renewable resources.

to draft environmental requirements for the maintenance and enhancement of environmental quality and productivity.

to guide international and intergovernmental negotiators on environmental matters, or under appropriate conditions, to be the negotiators.

to manage the fisheries and migratory birds.

in co-operation with appropriate agencies, to manage the air, water, lands, forests and wildlife.

to implement and, where appropriate, to enforce legislation and regulations falling within its jurisdiction.

to monitor environmental activity in federally-controlled or-financed activities.

### ATMOSPHERIC ENVIRONMENT SERVICE

#### Responsibilities

The Atmospheric Environment Service (AES) is responsible for the provision of historical current and predictive meteorological, ice and sea-state information services for northern areas, and of advice and consultation on the effect of meteorological, ice and sea-state conditions on natural processes and on human activities in the Arctic. AES is responsible for carrying out research and development to improve the information services and for undertaking research to increase knowledge of atmospheric processes and the dynamics of ice and wind-wave interactions. AES is also responsible for monitoring air quality (composition of the atmosphere) and for providing advice and consultation on the effects of human activities on the Arctic atmosphere.

### Review of 1973-1974 Operations

The AES operated two types of permanent meteorological observing networks to fill the continuing and increasing need for basic data by users of meteorological information in northern Canada. The stations in these networks carried out various observations according to internationally established standards. These observations included soundings of the atmosphere in depth with balloon-borne instruments (rawinsonde), synoptic surface-based observations of instrumental and visual elements made at three- or six-hourly intervals, and hourly-surface observations in support of aviation operations. A third permanent network of climatological stations added basic surface measurements of temperature extremes and of precipitation to those made by the major networks.

At the close of the fiscal year 1973-1974 there were 68 principal stations of which 15 provided upper air (rawinsonde) data of temperature, humidity, wind direction, and speed to altitudes of about 100,000 feet as well as combining with the remaining 53 stations to report the standard surface-based information of air temperature, barometric pressure, humidity data, surface wind, cloud data, and precipitation among others. The number of stations of these types represented an increase of ten over those operating in 1972, a reflection of the plans stated in the 1972 report for expansion and increase of operations in the Arctic.

The climatological network consisted of 36 stations, a decrease of six from the previous year. However, in spite of this overall decrease, the planned establishment of the climatological station chain across the

ackenzie Mountains to measure precipitation and temperature was partially implemented by the inauguration of three stations in the Yukon.

The programs of observations, particularly relevant to the northern area of Canada, continued throughout 1973-1974. This included 26 snow-survey sites reporting weekly measurements of depths and water equivalent of the snow accumulation, 62 reporting sites of freeze-up and break-up, data of the ice cover on water areas such as the sea, lakes and streams, 25 sites reporting weekly measurements of ice thickness, and 9 reports of shore ice conditions during the navigation season. In addition to these land-based observations, complete weather observations of the synoptic type were reported on regular schedule by ten government and five commercial ships in northern waters including one commercial vessel operating on Great Bear Lake during the navigation season.

Observational programs of a more specialized nature continued to be carried on many of the Arctic stations, such as those reporting soil temperatures at a number of levels below the earth's surface, one station reporting frost depth in the ground, five stations reporting water evaporation during the summer season, two of these have recently commenced a special extension of this involving the use of a radioactive tracer element (tritium), 23 stations measuring the radiation of bright sunshine, and 15 recording measurements of solar and terrestrial radiation. One of the upper air stations, that at Resolute Bay, reports scheduled daily measurements of the total ozone in the atmosphere as it has done for some years, and these are supplemented by weekly measurements of the ozone layer in the high atmosphere by a balloon sounding instrument.

A new program commenced in the Arctic in 1973-1974 with the beginning of measurements at Fort Simpson of air humidity and of chemical pollutants in precipitation.

Two programs continued to be conducted by other government agencies at AES Arctic stations — radioactive sampling of the atmosphere for the Department of National Health and Welfare at five sites, and the servicing of seismological records for the Department of Energy, Mines and Resources at Inuvik, Whitehorse and Frobisher. In addition to these last, AES provided accommodation and other support for EMR

staff conducting seismic recording at Resolute Bay, Alert and Mould Bay.

The five weather stations formerly known as the JAWS, which form a very important part of the principal observing network of combined surface and upper air reporting sites, continued to function as in previous years but now under the title of High Arctic Weather Station (HAWS) with complete operation by Canada. Four of them, Resolute, Isachsen, Eureka, and Mould Bay continue under AES management with MOT assistance to provide a wide range of support to government and other scientific agencies. The remaining site at Alert, formerly under AES control, was officially turned over to the Department of National Defence early in 1974.

Three of the surface weather stations of the principal network, Old Crow, Cape Dorset and Koartak continued in 1973-1974 to be operated by Indian and Inuit people. In addition, five stations in the climatological network commenced operation by indigenous people at Eskimo Point, Whale Cove, Grise Fiord, Spence Bay and Repulse Bay during 1973-1974. It is planned to gradually increase the scope of the weather reporting program at these stations as the observers increase in proficiency.

An inspection program continued as in previous years to provide on-the-job staff training and observing quality control, to determine the site selection and make the instrument installations for the establishment of new stations, and maintain the station instruments and equipment. During the year, a total of 6.2 man-years were devoted to this activity, the total including both the actual visits to the Arctic sites and the extensive preparations at the inspectors' headquarters required beforehand. While this activity represents a relatively high level, experience shows that more time must be devoted to those environmental parameters, the difficulty of travel, and the extra time required in dealing with observing programs which are operated by contractual arrangements and which in the cases noted above involve the training and guidance of native people.

In February 1974 a resident inspector was assigned to Whitehorse to be responsible for inspection, installation and maintenance activities for the Yukon. The number of resident inspectors in the area north of 60° was increased to three, two men on the Dewline and one in the Yukon.

The staffing of 68 principal weather stations during 1973-1974 was as follows:

AES	16
AES/CATA (MOT)	8
CATA (MOT)	10
OMSI (Dewline)	18
Contract	16

Of the activities planned by AES for 1973-1974, the rebuilding of Inuvik upper air station on a new site has been completed, while the similar project for Clyde River weather station was delayed. New stations for the principal surface network were established at Fort Liard, Cape Herschel and Haines Junction. The formerly limited observing programs of the weather stations at Dewline sites were increased during the year to include regularly scheduled reports in support of aviation at ten of them, from Tuktoyaktuk to the east coast of Baffin at Broughton Island, and including as well the added schedule of four primary synoptics at another seven of the sites.

#### Dewline Sites Weather Stations

Daily and hourly reports at 00,06,12,18 GMT: (previously "ON REQUEST" only)

Broughton Island  
Cape Hooper  
Dewar Lakes  
Longstaff Bluff  
Pelly Bay  
Byron Bay  
Clinton Point  
Gladman Point  
Mackay Inlet  
Tuktoyaktuk

Daily, hourly and synoptic reports at 00,06,12,18 GMT:

Cape Young  
Komakuk Beach  
Shepherd Bay  
Nicholson Peninsula  
Jenny Lind Island  
Lady Franklin Point  
Shingle Point

To make this weather data available on a real-time basis to both national and international users, as well as providing a return flow of forecasts and advisories, the AES uses a number of communication facilities. Where appropriate, both teletype and facsimile communications are used through a combination of MOT operated radio circuits, circuits in the Dewline forward scatter facilities, and lease of circuits from the common carriers.



Direct transmission of weather facsimile charts for Whitehorse to Inuvik is possible via the CNT radio microwave troposcatter system. Other areas of the Central High Arctic are served by radio facsimile broadcast from VFE Edmonton. Ice reconnaissance aircraft landing at Inuvik or Frobisher make direct transmission of ice data in facsimile chart format over telephone or broadband circuits to Ice Central, Ottawa.

Weather forecasts for the North are issued on a scheduled basis by the AES. The techniques of weather forecasting utilizes the data received from the north as well as that from all the northern hemisphere. The Canadian Meteorological Centre (CMC) in Montreal is responsible for broad-scale weather analyses, prognoses, and selected forecast material. This centre is supported by a large computer, has access to weather satellite data and also has access to products from the World Meteorological Centre in Washington. Output from the CMC is distributed via teletype and facsimile throughout Canada, including the North, to support forecasting and weather service activities. The Arctic Weather Central/Weather Office in Edmonton produced forecasts for most of the Arctic. Forecasts for the Yukon are produced at Whitehorse.

Current and predicted weather information for northern areas was routinely supplied as follows:

High-level winds and temperatures for aviation produced by computer in Washington and distributed in Canada by facsimile.

Lower-level winds and temperatures for aviation produced by computer in the CMC in Montreal and distributed by teletype.

Weather forecasts for aviation in the North were issued from the Whitehorse weather office and the Edmonton arctic weather office, and distributed by teletype and radio.

Terminal and advisory forecasts were added for several new airports, used particularly by the oil industry. Four additional meteorologists were assigned to the Arctic Weather Central, Edmonton to provide more specialized consultation on Arctic problems.

A general weather summary and forecast for the Arctic is prepared at Edmonton. More detailed forecasts for the general public are prepared at Whitehorse for the southern and central Yukon, at

Edmonton for the Mackenzie Valley, and at Frobisher for southeastern Baffin Island. These forecasts reach the public by the CBC northern networks and other private commercial radio and TV outlets.

Marine forecasts are prepared during the shipping season for arctic coastal waters, Hudson Bay and the inland waters of Great Slave Lake, Great Bear Lake and Mackenzie River. These forecasts are broadcast by MOT Marine Radio Stations on regular schedules.

Fire-weather forecasts are prepared during the forest fire-hazard season. Whitehorse prepares these for the Yukon Forest Service and the Edmonton Arctic Central for the Northwest Lands and Forest Service.

Weather services consisting of briefing, presentation, and consultation are available at Whitehorse, Yellowknife, Inuvik, Resolute, Frobisher Bay, and Churchill. A more limited type of weather service is available at many other points, but these take the form of a request and reply service.

Instruments for measuring meteorological parameters were replaced or installed at a number of sites. Specialized instrumentation for use in the arctic climate and with a potential for automation are being developed and evaluated.

Under the supervision of the Atmospheric Instruments Branch field evaluation was continued at Resolute of a self-contained, battery-operated, unattended, climatological automated recording station (CARS). This model records wind run, wind direction, air temperature and precipitation at three-hourly intervals by means of a cassette magnetic tape with a one-year recording span.

A small contract has been let for studies for feasibility of communications for real-time meteorological data from arctic coastal areas.

Central Services Directorate provided a broad range of consultation in the meteorological aspects of design, operational and environmental impact problems in response to the high level of exploration and development activity in the Arctic. A meteorological study of the Strathcona Sound area, to provide information for airport location and design, is underway. In-depth meteorological studies to support planning for the

development and usage of Baffin Island, Nahanni and Kluane National Parks are in progress. A chapter on the "Climate of Hudson Bay" was prepared for the Canadian Hydrological Service's third edition of the "Labrador and Hudson Bay Pilot". A study of climatology of the Yukon is in preparation with the intention of providing a comprehensive reference work to meet the needs of a wide variety of users. A study of the occurrence of ice fog at a number of sites was begun to provide information for the planning and assessment of future northern developments.

The Ice Division of Central Services Directorate is responsible for collecting data and providing information on ice conditions in the navigable waters of Canada.

Ice Forecasting Central, Ottawa, provides tactical and long-range ice forecasts for Hudson Bay, Foxe Basin, and the eastern and western Arctic during the summer months, as has been done for several years. The short-range forecasts were forwarded to marine radio stations at Frobisher, Churchill, Resolute Bay, Cambridge Bay and Inuvik for broadcast or for relay to specific ships. The longer-range forecasts were distributed by mail.

In Hudson Bay forecasting begins in early July and continues until early November. Nineteen hundred and seventy-three was a normal year in Hudson Bay insofar as break-up was concerned. Freeze-up was about three weeks later than normal. Forecasts for the Arctic areas began in mid-July and continued until early October. Despite the larger than normal quantities of second and multi-year ice in Arctic waters, the 1973 summer season was a remarkably good one in the eastern Arctic and Beaufort Sea, the third consecutive year for the latter area. A ice forecaster was assigned to Resolute to operate a field office to provide on-the-spot assistance for sea-lift operations from early August to early September. As indicated in the 1972 report, the ANIK satellite was successfully tested as a means of providing supporting information to the field ice forecaster at Resolute.

In addition to the above, ice information received from the reconnaissance aircraft was also broadcast by facsimile over CFH, Halifax, and VFE, Edmonton. These relays were performed from early July until mid-November. Charts of existing conditions were mailed weekly to a list of 50 to 100 subscribers in Hudson Bay, eastern Arctic and western Arctic. These charts, too, were available from mid-June until November.

In 1974 the operational program is not expected to be changed significantly, although the beginning and completion of recast preparation will depend on shipping conditions and the timing of the activity. If special probes are conducted by icebreakers, support will be provided as required.

Experimental forecasts of ice conditions in the Beaufort Sea and Hudson Bay were prepared in anticipation of off-shore drilling in these areas. These forecasts were not distributed but evaluation showed they were quite good in the Hudson Bay area; however, results remained inconclusive in the Beaufort area.

AES ice observers for the third year carried out year round ice surveillance in the Arctic. Aircraft used to conduct this ice reconnaissance principally highlighted the navigation season with overall utilization of 225 flying hours.

Line-mile efficiency was improved with the use of two Electra L188C aircraft configured for the ice reconnaissance task to the best standards of the aviation industry.

The primary Electra aircraft were supplemented through the entire year with Canadian Forces Angus flights to the Arctic in which our ice observers were invited by DND. As with short-range helicopter missions from MOT Coast Guard icebreakers are flown as necessary for close-in support.

AES ice observers served over 900 days on Coast Guard icebreakers in the Arctic which assisted commercial shipping as necessary. During this time the personnel required almost 2,000 weather and ice reports which increased the availability of data for the forecast system in areas of sparse observations.

Over 1,500 airborne facsimile transmissions, aircraft to ships, were made to Coast Guard icebreakers to supply almost real-time ice information. As well 1,250 aerial weather observations were taken over significant sea areas and fed into the forecast system.

Development of the remote sensing program continued during the year. A one-week course in application of remote sensing over sea ice was conducted in December. Incorporation of laser profile information on ice heights and frequencies will now be incorporated in the operational mapping. Twenty-one prime remote sensor target areas have also been identified in the North to provide representative sampling of ice conditions for climatological applications. Remote sensors are operated during the visit of any of these areas.

In August, a cooperative project was undertaken with DND to acquire Side Looking Airborne Radar imagery over arctic ice in conjunction with the recording data by visual and other remote sensing techniques. The data will be used for an in-depth study of SLAR imagery.

The Research Directorate of AES continued developmental work in atmospheric modelling applicable to the weather forecasting system with the purpose of improving weather forecasting in all areas of Canada. Weather satellite photographs of all Canada were received, processed and distributed, and possible acquisition of a facility to receive higher resolution satellite photographs was studied.

Activities in the air quality field included:

Air quality observations (turbidity and precipitation chemistry) were begun at Fort Simpson under the world-wide air quality monitoring program of the World Meteorological Organization.

A contract was initiated to study relationships between meteorological conditions and damage to lichens from sulphur dioxide.

Plans for Strathcona Sound development and ice-borne oil drilling operations were reviewed for potential effects on air quality.

#### Plans for 1974-1975

Data acquisition facilities and/or programs will be expanded or improved as indicated below:

#### High-Arctic Stations

Continuing construction, improvement and rehabilitation at the High-Arctic Stations — Alert, Eureka, Isachsen and Mould Bay, including sewage disposal facilities, living accommodation, warehouses, as well as replacement of heavy equipment.

#### Inuvik

Relocate meteorological instruments.

#### Fort Reliance

Construct storage building.

#### Colville Lake

Establish a program of 16 per day hourly observations by local people.

#### Fort Franklin

Establish a partial program of daily hourly observations by contractual arrangement.

#### Dewline

Transfer responsibility for supervision and inspection of meteorological data acquisition at Dewline stations from AES Headquarters to Western Region, AES.

Rehabilitation of meteorological equipment, including ceiling projector systems, to be continued.

#### Clyde River

Commence reconstruction and relocation of weather station; train native people to participate in weather observing program.

#### Pond Inlet

Expand the existing climatological program of daily temperature extremes and wind record to a full program of eight synoptic observations per day by contract with native people participating.

#### Igloolik

If Arctic Laboratory is completed in 1974, expand weather observing program with participation of native people.

#### Gjoa Haven

Establish climatological observing program, including daily temperature extremes, precipitation and recorded wind speed and direction by contract with participation of native people.

#### Grise Fiord

Expand weather observing program with participation of native people under contractual arrangement.

#### Mackenzie Mountains

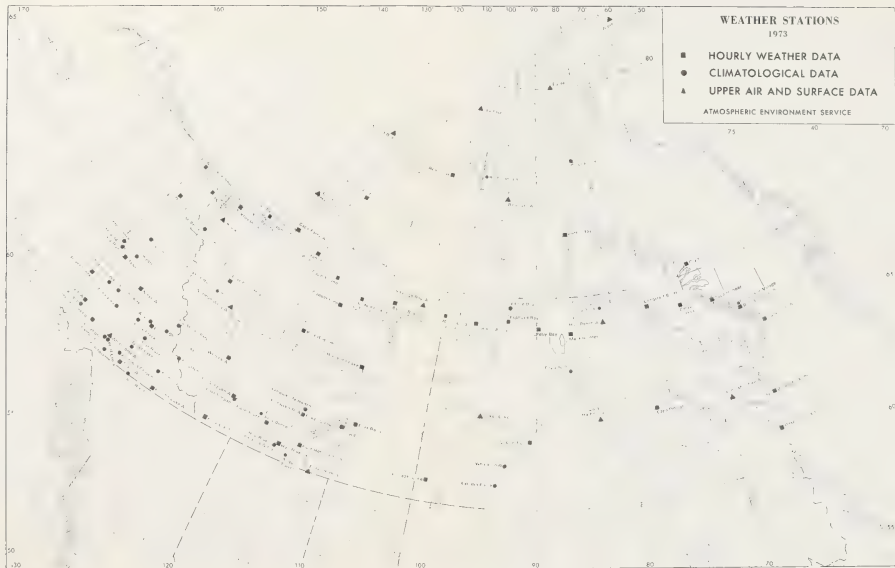
Complete the installation of a network of five storage precipitation gauges in a "traverse" across the Mackenzie Mountains. Three gauges have been installed in the Yukon and two sites to the east of the mountains have yet to be completed.

Meteorological information services will be improved by adding five meteorologists to the Arctic Weather Central, Edmonton, to meet increasing demands from industry for more specialized and consultative services on Arctic problems. In cooperation with CBC Northern Service, weather forecasts will be televised via the ANIK Communications Satellite twice daily and will describe expected weather conditions in the Arctic.

AES Instruments Branch will continue the operational evaluation of climatological automatic recording stations (CARS) at









ected stations in the Arctic and will participate in the operational evaluation of automatic recording stations which are similar to CARS, but linked to a satellite communications system. The Branch will be engaged in designing, developing and field testing a prototype Arctic ice pack station which measures wind, pressure and temperature.

Central Services Directorate plans to complete National Parks, Strathcona Sound and ice fog studies and the reference work on the climatology of the Yukon. During this period, the laser profilometer and infrared scan system are expected to become fully operational in real-time ice reconnaissance applications. Improved maintenance programs for the sensors are to be undertaken through contracted technical support. Preparation of specifications and letting of contract for acquisition of SLAR systems for ice reconnaissance aircraft is planned. Further projects for studying interpretation problems of SLAR imagery will be undertaken.

AES Research Directorate plans full (or partial) implementation of new atmospheric models into the Canadian weather forecasting system; specifically, application and testing of a regional automated prediction system will be carried out in the western Arctic. Air quality observational program will commence at two additional arctic sites, Foul Bay and a location in the eastern Arctic. A high tower will be instrumented to study the behaviour of low-level inversions and these affect the dispersion of pollutants. Contracts for lichen-damage studies will be continued.

#### Long-term Plans

To increase knowledge of the Arctic atmospheric environment, its effect on other natural environmental processes and on human activities, and the effect of human activities on the Arctic atmospheric environment.

To continue to assist other agencies by providing meteorological support for joint projects directed to better understanding the Arctic environment, defining the economic potential of the North and supporting the Arctic economy.

To extend the operational and climatological atmospheric data acquisition work in the Arctic essential to the extension of knowledge and improvement in meteorological and climatological services of the area.

To improve the meteorological instrumentation adapted to Arctic environment and, in particular, to develop the capabilities of, and increase the use of, automatic equipment.

To improve meteorological communications throughout the Arctic, utilizing satellite facilities where practicable.

To extend the application of automated prediction procedures to the Arctic and to improve the meteorological forecasts in the Arctic, particularly those in support of transportation, construction and industry.

To extend and improve the meteorological forecasts in the Arctic, particularly those in support of transportation, construction and industry.

To improve and extend aerial ice reconnaissance in the Arctic to a year-round, day-and-night, all-weather operation to meet the growing economic needs of the North.

To achieve arctic ice data and to prepare and publish an arctic ice atlas.

To specify the physical/chemical process affecting the transport and deposition of air pollutants under arctic weather conditions, and to identify global and regional trends in air quality (the composition of the arctic atmosphere).

To participate in constructive international programs for increasing knowledge of the Arctic environment.

To employ more indigenous residents in meteorological activities.

## FISHERIES AND MARINE SERVICE

### Responsibilities

The Fisheries and Marine Service has overall responsibility for fisheries research and operations throughout Canada and for the implementation of oceanographic and hydrographic programs of the Federal Government. Specific responsibilities in the North concern the maintenance and development of fish and marine mammal stocks and assessing the impact of future development of these stocks; upgrading commercial fishing practices and carrying out an inspection program of northern processing plants; and carrying out physical and chemical studies of the arctic marine environment on such matters as tidal characteristics, wave regimes, pollutants and the properties and distribution of ice. Continuing activities also include hydrographic and resource studies of northern waters and the publication and maintenance of up-to-date nautical charts, tide tables, etc. of the region.

## Resource Management Branch

### Responsibilities

To protect and conserve fishery resources and adequate environment.

To manage and seek improvements in the management of commercial, sport and subsistence food fisheries.

To gain a thorough knowledge of the aquatic resources of the North so that the impact of future developments can be accurately assessed.

### Review of 1973-1974 Operations

Further bio-engineering studies were carried out at the proposed Aishihik Lake Hydro Development to assess the effect of the provisional licence permitting Northern Canada Power Commission to proceed with construction under certain conditions.

Biological studies were initiated at the Whitehorse Hydro damsite in connection with N.C.P.C.'s plans to expand the facility. This will be a three-year program and in 1973 concentrated on the effects of the damsite on the downstream migration of chinook salmon fry and smolts.

An assessment was made of the effects of shut-down and maintenance at the Mayo River Hydro control structure at Mayo Lake.

In connection with the proposed pipeline developments, an inventory of fish resources was continued in the Beaufort Sea drainage and the Porcupine drainage. This is the third year of such studies and effort was concentrated in areas that may be critical to fish production.

The effects of placer mining were reviewed and a statement of fisheries concerns was presented to the Yukon Territorial Water Board. This resulted in the development of guidelines that would apply to placer-mining water-licence applications and provide a measure of protection for the fishery resources.

Oil and gas operations continued to be monitored, especially in the Beaufort Sea where seismic activity is relatively intense.

A major salmon distribution and enumeration program was carried out in the Yukon River system providing a great deal of new information to acquaint the Alaska Department of Fish and Game with Canadian fishery and conservation needs.

A review of the Yukon Territorial Fishing Regulations was completed and amendments passed to encourage the development of commercial fisheries and to better control certain developments within streams in the territory.



The aquaculture program was continued with 25,000 rainbow trout in a total of eight lakes in order to assess growth potential in a variety of lake regimes.

Inventory of work was continued with catalogues published for the Teslin and Carmacks areas.

The Arctic Land Use Research Mapping Program was continued and has now covered all areas of the Yukon Territory. This program is now complete in the Yukon although frequent revisions to the data will be necessary.

A draft of revised fishery regulations for the Northwest Territories was completed and submitted for final review.

Assessment of sport fish harvests on Great Bear and Great Slave Lakes was continued. Proposed new catch limits were discussed with resources users, with a view to implementation of some reductions in 1974.

Plans for construction along the Mackenzie highway were reviewed and specifications developed for bridge and culvert design to ensure protection of the fishery resource.

A study was conducted on the swimming abilities of various northern fish species to provide a basis for specifications for culverts at streams crossings.

Plans for various offshore drilling developments were reviewed and requirements for protection of the fishery resource developed.

Studies were conducted on the toxicity of fluids used in exploratory drilling for oil and gas in the Canadian Arctic.

Plans for a proposed lead-zinc mining development at Strathcona Sound, Baffin Island were reviewed.

Plans for dredging the Mackenzie River were reviewed and studies conducted to investigate the possible effects on the fishery resource.

Fishery resource studies were conducted in relation to proposed hydro power developments on the Snare, Kakisa and Great Bear Rivers.

A new fisheries laboratory was completed at Hay River.

Studies were carried out on two populations of arctic char on the Hudson's Bay coast near Rankin Inlet as part of a program to establish rational harvest quotas for these populations.

A review of information relating to arctic mammal populations and the relevance of present marine mammal legislation was commenced.

Studies were commenced on the sport fishing potential of areas close to major northern communities such as Yellowknife and Hay River.

Studies on hooking mortality in lake trout were conducted on Great Slave Lake and a report published.

#### Plans for 1974-1975

All active field programs will continue in 1974-1975.

Fisheries Management studies may include a more detailed investigation of mainstem Yukon salmon spawning and some experimental lake fisheries.

Chum salmon enumeration at the Fishing Branch River will continue for the fourth year in order to determine the cyclic size range of this stock.

The aquaculture program will enter a new phase with several pilot projects by private individuals being assisted by the Fisheries and Marine Service to determine the viability of the type of fishery and acceptability of the product for export out of the Territory.

The fish stocks inventory program will continue in combination with hydro development plans for the upper Yukon river.

The final year of pipeline-related studies will concentrate on critical areas and times, pipeline crossing sites, report and catalogue completion.

Hydro studies will be continued at Aishihik Lake where minimum flows have to be determined between Aishihik and Canyon Lakes in order to protect stocks of fish — especially grayling — that depend on the river for food, spawning and migration. New studies are called for on the upper Yukon river following a decision by N.C.P.C. to rebuild a larger Marsh lake storage dam. Further monitoring of Mayo dam maintenance will be necessary in 1974 as N.C.P.C. have tentative plans to repair the main penstock outlet areas.

A major study of the effects of placer mining on stream habitat is planned and will cover all historic placer mining areas in the Yukon. Another placer-related environmental study will be required for large sections of the Yukon River mainstem if recent assessment work shows sufficient gold-bearing sediment for a viable dredge operation.

Seismic activity in the Beaufort Sea will continue to be monitored and controlled where operations may damage fish stocks.

Preliminary studies will be conducted on the potential impact of proposed mining

developments on Baffin and Little Cornwallis Islands.

A new set of fisheries regulations for the Northwest Territories will be introduced.

Some expansion of the arctic char investigations will take place.

Studies to determine probable environment effects of industrial development in the North on its aquatic resources will continue.

#### Long-term Plans

Maintenance and development of fish and marine mammal stocks in the North through the proper use of resources and equipment.

Inventory of the fishery resource potential of the Northwest Territories.

Investigation and management of the fisheries of Great Slave and Great Bear Lakes.

Establishment of a comprehensive plan to manage other lakes for sport and commercial fishing.

Inventory and management of the stream sport fisheries based primarily upon the arctic grayling.

Compilation of a physical and biological inventory of all fish-producing streams in the Yukon.

Efficient management of the anadromous arctic char fisheries of the north coast.

Development of criteria for the protection of aquatic resources from pollution and environmental disturbances.

Minimization of the adverse effects of industrial development by making recommendations to the developer, enforcing regulations and understanding the resource.

Development of new fisheries through aquaculture and the harvesting of hitherto under-utilized species.

#### Inspection Branch

##### Responsibilities

Monitoring and standardizing of fish processing plants to ensure construction equipment and operating regulations are followed.

Technical assistance in handling, processing, transportation, storage and distribution of fish and fish products.

Laboratory analysis of domestic and imported products, plant sanitary surveys, water and ice analyses.

Inspection of freshwater species to ensure market acceptance of domestic and export fish and fish products.

Inspection of fishing vessels for compliance with national vessel inspection regulations.

Assistance to industry towards cost of constructing, equipping or modifying ice-fishing or ice-storage facilities.

#### Review of 1973-1974 Operations

Annual registration of processing establishments in the N.W.T. (There are six registered processing plants, one registered fishery and numerous non-registered fishing plants).

Setting up an adult education program in cooperation with Territorial officials to aid primary commercial fishermen in catching, handling, and storing freshwater fish.

Collection of end-of-line samples, water and ice samples, in-plant sanitary surveys, quality determination, *T. crassus* determinations.

Setting up training courses at various locations for primary commercial fishermen and industry management personnel.

Surveying 83 of 95 fishing vessels as part of a pre-certification program.

#### Plans for 1974-1975

To complete surveys of commercial fishing vessels as the basis for an inspection and certification program.

To complete analytical surveys for hazardous substances on all affected freshwater species for commercially fished waters and imported fish and fishery products and provide analytical services to other agencies, services and the private sector on contaminants and sources of industrial pollution.

To develop grade standards for fresh, frozen, canned, packaged and cured fish and fishery products in order to establish baseline data on present quality levels from processors, plants, vehicles and retail outlets.

To complete field retrieval and computer processing and working data on all facets of fishery control and production, including harvesting, transporting, processing, distribution, and all hazardous substances and chilling requirements on domestic and imported fish and fishery products.

To conduct design development and certification studies on present construction equipment and operating requirements of vessels within central region.

To promote fish-chilling assistance re: packing and ice storage facilities in the N.W.T.

To become significantly involved in vessel assistance, vessel subsidy, small craft surveys in conjunction with other federal and provincial agencies.

#### Long-term Plans

The continued inspection of domestic and imported fish and fish products to maintain standards pertaining to hazardous substances, organoleptic, bacteriological and labelling requirements, and to assist industry in improving processing techniques and product development.

To complete current surveys aimed at determining what facilities are used for holding and transporting fish, i.e. boats, land vehicles and planes, to improve quality and eliminate rejection due to spoilage of five per cent of total fish landings.

To implement a comprehensive fishing information system to improve the fish trade in Canada through diversifying products and penetrating additional export markets.

To initiate a certification program for commercial fishing vessels.

To promote an increase in ice supplies and chilling facilities in the primary fishing industry, which will reduce waste of the resource, improve fish quality and increase fishermen's earnings.

To carry out surveys on 20 unregistered fish plants to determine construction, equipment and operating compliance with basic sanitation as a requisite feature.

#### Freshwater Institute, Winnipeg, Manitoba

##### Responsibilities

Investigation of the freshwaters of the Northwest Territories with emphasis on fisheries and aquatic environment.

#### Review of 1973-1974 Operations

A successful winter program was carried out in 1972-73; the open-water operations began May, 1973. Yellowknife was the field HQ with field bases at Fort Simpson, Inuvik and Caribou Bar Creek, Y.T. The research vessel *Stenodus* was activated at Hay River, re-commissioned at Yellowknife and stationed in Inuvik. This vessel was used for synoptic work on the Mackenzie and in the Delta program. The Caribou Bar Creek campsite was cleared and its buildings (Parcolls) were dismantled at the end of a successful season and stored at Yellowknife.

The intensive studies of naturally disturbed and experimentally manipulated ecosystems which began in 1972 (Martin River Highway Crossing, Caribou Bar Creek mudslide and oil spill, Mackenzie Delta lake oil spill) were continued through 1973. These studies were expanded to include experimental incremental additions of suspended sediment to a section of river and

two oil spills on partitioned areas of Mackenzie Delta lakes. The latter experiment was carried out in conjunction with Inland Waters Directorate, DOE. The initial effects resulting from these experiments were assessed and longer-term monitoring programs were initiated.

The rates of erosion and suspended sediment transport within watersheds under study were measured. The relationship between these parameters and the distribution and abundance of zoobenthos resulting from 1972 studies was tested and is still under study.

Intensive exploitation of whitefish in three experimental lakes north of Yellowknife was successfully completed. Monitoring of fish populations, plankton and benthos in the three exploited lakes and control lake was continued. A study of whitefish food and the relationship between food supply and production was continued. A survey of char streams in the area of Bathurst Inlet and Kent Peninsula was successfully completed. A research site on Kent Peninsula for an intensive study of the biology and productivity of arctic char was selected.

The intensive study of the biological and chemical cycling of arsenic in selected Yellowknife area lakes was continued. Particular emphasis was placed on the relative proportions of this pollutant in the oxidized and reduced form and the factors which may affect this ratio, e.g. eutrophication resulting from domestic waste and sewage disposal.

#### Plans for 1974-1975

To wind up the pipeline study by completing the monitoring of the disturbed areas. To assess the recovery of these systems as far as this is possible within the period of study. To carry out small scale experiments involving experimental additions of suspended sediment to a partitioned section of river and the effect of crude oil and dispersants on Mackenzie Delta lake biota. These experiments are designed to test hypotheses arising from 1973 work.

Computerized models describing the relationship between specific disturbances, physical/chemical parameters and distribution, and abundance of zoobenthos will be generated. The study of the biogeochemistry of arsenic in Yellowknife lakes will be continued.

Harvesting and monitoring of fish populations and other aspects of the lake



community will continue on the four experimental lakes north of Yellowknife. A camp will be established at the arctic char research site on Kent Peninsula and basic laboratory and living facilities set up at Cambridge Bay. Biological work on char populations on Kent Peninsula will begin.

#### Long-term Plans

The assessment of the aquatic ecology of the Mackenzie River and selected areas in the Porcupine River drainage; an investigation of the ecological factors controlling the diversity and abundance of bottom organisms in rivers and lakes; predictions concerning the ecological effects of increases in suspended sediment load and crude oil spills on Mackenzie and Porcupine system watersheds in relation to the construction, operation and maintenance of proposed gas and oil pipelines.

Improved management techniques for northern fish stocks, particularly whitefish, lake trout and arctic char will be developed. Methods to assess proposed and ongoing fisheries, both commercial and sports, to ensure optimum harvest, will be developed. The impact of such projects as pipeline construction, hydroelectric impoundments, waste disposal on fish and fisheries will be studied.

A limnological survey of the Yellowknife area with emphasis on the effect of mine-wastes (largely arsenic) on aquatic ecosystems.

#### Arctic Biological Station, Ste. Anne de Bellevue, Quebec

#### Responsibilities

Biological investigations of the marine environment in Canada's North, especially the distribution and abundance of marine mammals and fishes, and the ecological factors that control production.

#### Review of 1973-1974 Operations

##### *Marine Mammals*

A detailed study of local areas of high productivity of ringed seals was continued in the Holman area, western Victoria Island. Factors such as ice type, snow cover, availability of food species, and predation rates by fox, bears and man were quantified. An aerial survey of the Coronation Gulf and Dolphin and Union Strait, indicated generally low productivity for the area. Analysis of the Coppermine Inuit sea catch confirm these findings, and suggest a movement of

seals into the Coppermine hunting area from unexploited areas.

A preliminary survey of the Cunningham Inlet area, Somerset Island, revealed large numbers of white whales using the area during the calving period. A survey of white whales in the western Arctic showed a minimum of 4,000 animals and established migration patterns synchronous with that of the bowhead.

A survey of bowhead whales in the western Arctic showed animals present in the low hundreds from May to September.

##### *Biological Oceanography*

Studies continued on the marine ecology of the Eskimo Lakes, an estuarine inlet of the Beaufort Sea lying just east of the Mackenzie Delta. Physical oceanography and nutrients were observed on a regular basis, to support biological sampling (bacteria, benthos, plankton), and experimental work on invertebrate physiology was begun.

A survey was done to assess biological productivity of the waters of the south Beaufort Sea. A rather sparse fauna was found, with evidence of low biological productivity adjacent to the delta of the Mackenzie River.

A brief period of continuation of the Frobisher Bay marine ecology study was concerned mainly with an assessment of the role of tides in affecting nutrient levels.

##### *Marine Fishes*

Further studies on the abundance of benthic fishes, particularly the arctic sole were carried out in Liverpool Bay, just east of the Mackenzie Delta. Distribution and abundance of larval pelagic fishes in Amundsen Gulf were investigated, and distribution of marine and anadromous fish in Kugmallit Bay, Mackenzie Delta was examined. The distribution and status of anadromous and freshwater fish in the lower reaches of the rivers of eastern James Bay were assessed.

#### Plans for 1974-1975

Studies of ringed seal breeding areas will continue at Holman. Areas of high and low productivity will be compared, and factors affecting production and survivorship will be quantified. A short-term study of the effects of crude oil pollution and seismic explosion on seals will be carried out at Brown's Harbour, Cape Parry. Live seals will be transported to our facilities at the University of Guelph for joint studies on the bioenergetics of ringed seals.

Further studies on white whales in the Mackenzie Delta and southern Beaufort Sea will be undertaken. Reliance of these stocks upon specific inshore and offshore areas will be assessed.

Further studies on bowhead whales will plot migration routes and summer distribution, with special attention to possible exploration and drilling activity in these areas.

An aerial survey of seal stocks of western Hudson Bay will be carried out jointly with the Canadian Wildlife Service to determine numbers of seals in the area, with special reference to their availability as food for polar bears.

The Foxe Basin and northern Hudson Bay walrus stocks will be assessed. Emphasis will be placed upon their reliance on known hauling-out sites (*uglit*) and the effects of human disturbance upon these areas.

Summer concentrations of white whales in Cunningham Inlet, Somerset Island will be further investigated to determine the reasons for the occurrence of large concentrations of whales in shallow deltas during July and August, and the vulnerability of the stocks in such areas.

Additional information on the utilization of offshore waters by anadromous fish is planned for Mackenzie Bay. Vessels under charter to the Beaufort Sea Project will also provide facilities for sampling offshore planktonic fish larvae in the project area.

Investigations of James Bay fish abundance will be continued.

A further season in the Eskimo Lakes will comprise mainly bacterial, plant and invertebrate physiological studies. A cruise in the south Beaufort Sea, extending as far north as the shelf, is planned with Beaufort Sea Project support. This will continue last year's survey, add much to the size of the area covered, and give support to many of last year's observations.

#### Long-term Plans

Biological assessment of fisheries resources will be continued to provide information for the management of fish and marine mammal stocks. Emphasis will be on population studies but physiological studies will attempt to relate these animals more closely to their environment, and to the effects of disturbance by man. Marine productivity studies will be continued in order to provide a basis for assessment of possible environmental changes caused by exploitation of non-renewable resources such as oil and gas.



## Arctic Sciences Directorate

### Responsibilities

To carry out hydrographic and oceanographic surveys in northern waters. To produce and distribute nautical charts, sailing directions, tide tables and reports used on survey activities and other sources.

To carry out physical and chemical studies of the arctic marine environment to determine the circulation, wage regimes, tidal characteristics, properties and distribution of ice; and to develop mathematical simulation models on the behaviour and movements of ice and pollutants in the arctic archipelago.

### Review of 1973-1974 Operations

In the Lancaster Sound area of the Northwest Passage, CCS *Baffin* conducted a major multidisciplinary survey.

Detailed surveys were also made of Maxwell Bay — a potential deep water port.

CCS *Parizeau* carried out a major multidisciplinary survey in Amundsen Gulf in the eastern Arctic.

In the same area, a hydrographic officer conducted to the Polar Continental Shelf project assisted in a program sponsored by Earth Physics Branch, Energy, Mines and Resources.

In the arctic archipelago, the hydrographic team assigned to P.C.S.P. carried out through-the-ice sounding survey of Norwegian Bay.

In the sub-arctic, the main hydrographic activity was in James Bay where CCGS *Narwhal* completed route surveys from Hudson Bay to Fort George.

CCGS *N.B. McLean* was assigned to a minor survey program in Chesterfield Inlet during the month of September.

On the MacKenzie River, detailed and advisory surveys continued.

Reconnaissance surveys were undertaken the fall of 1973 by CCGS *John A. Macdonald*, CCGS *Louis St. Laurent*, CCGS *Immsell* and CCGS *D'Iberville*. The areas of operation included Peel Sound, M'Clintock Channel, Larsen Sound, Victoria Strait, Scher Channel, Penny Strait, Maury Channel and Queen's Channel.

CCGS *Labrador* was assigned to full-time hydrographic operations and carried out detailed surveys in McDougall Sound and at Little Cornwallis Island, where a new mine started production.

In James Bay a program of oceanographic observations similar to that of 1972 went forward in the CCGS *Narwhal* during the open season. Observations from the ice cover at a location west of Fort George were initiated in May of 1973 and are being continued during the 73-74 winter.

The Frozen Sea Research Group conducted a study of internal wave propagation in D'Iberville Fiord by the measurement of temperature variations. Later during the first melt an investigation to determine circulation and run-off was undertaken with extensive use of automatic instrumentation. Automated weather and tide gauge equipment has been operating over the winter season and will be recovered in 1974.

A field team visited Cambridge Bay early in 1974 to measure salinity concentrations in shallow waters.

Environmental advice on industrial activities in the Beaufort Sea, Strathcona Sound and Hecla Strait was provided. In the case of the Beaufort Sea a comprehensive set of environmental programs was organized and established under a project manager in Victoria. *In situ* tide and current meters were laid and preparatory activities carried out as part of this project.

Major effort was expended to develop a system capable of measuring water velocities in the special arctic environment.

The laboratory investigation into the variation of the freezing point of sea water with pressure was concluded and the results will be published in 1974.

### Plans for 1974-1975

Work will again be continued on the Mackenzie River.

CCS *Baffin* will undertake the completion of the 1973 survey in Lancaster Sound. Additional projects for Baffin will be Hall Beach and Igloodik.

CCGS *Narwhal* will be assigned to full-time hydrographic operations and will commence detailed surveys in Chesterfield Inlet.

The Meteorology Division of the Atlantic Oceanographic Laboratory will continue its Air-Ice Interaction program this year and in 1975. Wind stress, heat exchange and evaporation measurements will take place this year in Robeson Channel (between Ellesmere Island and Greenland) in conjunction with the Defence Research Board. In 1975, similar studies will occur with the AIDJEX Program in the Beaufort Sea.

The hydrographic team assigned to the Polar Continental Shelf Project, will carry out a through-the-ice sounding program of the Eureka — Nansen Sound System.

Depending upon the availability of Canadian Coast Guard icebreakers, surveys may be undertaken in the western part of Jones sound, Victoria Strait, Wellington Channel, Queen's Channel, Penny Strait, Byam Channel, and that area of Viscount Melville Sound south of Bathurst Island.

The winter program based on Fort George in James Bay will likely be continued.

S.T.D. soundings in Greely Fiord and a test of the current measuring system in D'Iberville Fiord will be carried out early in the fiscal year.

The hydrology of D'Iberville Fiord over the first melt in June will be extensively covered; and in August, if ice-free conditions prevail, an oceanographic survey will be taken.

The Arctic Pipeline Studies may require bottom current measurements at specific sites. There will be continuation of the support to DREP in the arctic archipelago.

A continuation of the tide and current survey in the Beaufort Sea will take place together with some general oceanographic studies. It is anticipated that C.S.S. *Pandora* will be in this area for part of the summer.

### Long-term Plans

To complete standard hydrographic and resource surveys of the northern waters as soon as possible and to continue the publication and maintenance of up-to-date nautical charts on the region. To carry out reconnaissance surveys when it is necessary to chart ahead of the regular surveys. To maintain reliable sailing directions as published in the Pilot of Arctic Canada. To publish tide tables to meet the needs of northern navigation and to carry out research to enhance our knowledge of tides in northern waters.

To gather and interpret chemical and physical oceanographic data for a study of the environmental conditions and properties and the dynamic processes that effect the distribution of potential pollutants; and the advection and mixing of arctic waters.

### ENVIRONMENTAL MANAGEMENT SERVICE

The Environmental Management Service is responsible for over-all coordination of

work carried out by the Lands, Forestry, Wildlife and Inland Waters Directorates. It also deals with environmental assessments and provides general leadership in the management, for continued productivity, of some of Canada's major renewable resources.

In general, its responsibilities include:

Initiation of national programs for the planning and implementation of water resources development and water quantity and quality research; development of policies and systems for hydro-metric data collection and networks, water and ice inventories and forecasting; national land use policy and planning initiatives in co-operation with other federal and provincial agencies; land use studies related to use dynamics of the resource; management and operation of a national land data bank; provision of a federal response to research and related service needs of provincial governments and wood-based industries; financial support and a research capability oriented towards environmental forestry including forest management on federal lands; migratory bird conservation and protection; wildlife advisory services and information to government and other agencies; wildlife research on toxic chemicals, wildlife pathology, interpretation, information and biometrics, wildlife research and management in co-operation with provincial and territorial governments; defence and encouragement of rare and endangered species; assessment of the effect of resource development and other operations on wildlife; and management of regional structures for federal forestry, water and wildlife operations.

## **Lands Directorate**

### **Responsibilities**

To supply and analyze data for land-based renewable resource inventories, regional planning and the assessment of resource development impacts.

### **Review of 1973-1974 Operations**

#### **Land Evaluation and Mapping Branch**

In conjunction with the ALUR Program of DIAND twenty-three Land Use Information Series maps covering the south-central Yukon were published in the summer of 1973. The maps, produced at a scale of 1:250,000 (1 inch to 4 miles), integrate a wide range of data on renewable resources

and related activities. Each map is complete with a detailed legend and the series includes information on: critical and important wildlife areas; fish resources and fishing; recreation and tourism potential and facilities; hunting and trapping areas; notes on communities; development areas and control zones; the location of hydrometric and water quality stations; archaeological and historical sites; proposed I.B.P. reserves; and parks and sanctuaries.

In early 1973 the series was extended to include seventeen maps of the Mackenzie and Selwyn mountains. Field studies were undertaken by the Canadian Wildlife Service, the Fisheries and Marine Service, and the Lands Directorate to generate data for the program. The maps are being compiled and drafted by the Lands Directorate and should be published during the summer of 1974.

As part of the Land Use Information Series an inventory of outdoor recreation potential was carried out for the seventeen maps referred to above.

#### **Land Use Planning Branch**

As part of an ongoing review of existing land use policies and legislation in Canada, the Land Use Planning Branch will be publishing a report on the northern territories towards the end of 1974. The paper will discuss the land use problems and the major concerns of the territories with regard to land use and land ownership. The role of the territorial and federal departments engaged in land use planning and/or land management will be outlined and the pertinent legislation examined.

#### **Plans for 1974-1975**

Most of the above programs will continue in 1974-1975. The Land Use Information Series will be extended to cover twenty-four maps in the Great Slave Lake region, to be published in 1975-1976.

A proposal has been submitted for the undertaking of an integrated bio-physical land resources survey as part of the studies for the Arctic Islands Pipeline Program.

#### **Long-term Plans**

Long-term plans for the Lands Directorate reflect its association with the Department of the Environment. Emphasis will be placed on studies and plans of land resources in cooperation with other agencies and services. A proposal has been submitted to begin a long-term integrated survey of bio-physical land resources in the North in 1974-1975.

## **Canadian Forestry Service**

### **Responsibilities**

To conduct forest insect and disease surveys; to prepare forest inventories and maps of forest and other vegetation.

To advise and assist the Department of Indian and Northern Affairs on forestry operations, practices and staff training.

To conduct ecological research in the North.

To participate in the conduct of environmental impact assessments of major industrial developments.

To compile national statistics on forest stocking, growth and depletion and annual fire losses.

### **Review of 1973-1974 Operations**

#### **Pacific Forest Research Centre**

Preparatory to assuming responsibility in the Yukon for forest research and service operations in 1974, discussions were held between P.F.R.C. and the Department of Indian and Northern Affairs at Whitehorse to establish communication and identify forestry problems and opportunities in the Yukon requiring attention of the P.F.R.C. The conduct of the forest insect and disease survey and the forest fire danger assessment were identified as priority items, together with a variety of miscellaneous silviculture nursery and inventory items.

A variety of services was performed for the Yukon Lands and Forest Service. These include advice on the establishment of the forest tree nursery at Whitehorse; assistance in preparing scaling regulations and advice concerning the OECD scheme for forest tree nursery at Whitehorse; assistance in preparing scaling regulations and advice concerning the OECD scheme for forest tree seed certification and its implementation. Certificates of provenance were issued for Yukon collections on lodgepole pine seed for Watson Lake and Upper Liard areas.

#### **Northern Forest Research Centre**

Reforestation trials continued in the Yukon and Northwest Territories. In this second year of a three-year trial, 4,000 container seedlings were planted.

Assistance was given to the Yukon Territory in the planning and design of a nursery complex near Whitehorse.

A forest fire detection and communication study was done for the Yukon. Fire lookouts at Wood Buffalo National Park were evaluated, and a joint Canadian Forestry Service — Canadian Wildlife Service



contract was let to assess wildlife operations in the N.W.T.

Detailed vegetation and soil studies were conducted, with emphasis on northern arctic and tundra regions. Ground movement caused by frost heaving was determined by tree ring studies. Changes in ice content of near-surface permafrost as determined and related to fires. Extensive botanical collections were made in previously unexplored areas.

#### Forest Management Institute

*Biophysical Mapping of the Arctic Archipelago* — Field work to develop a multi-level classification scheme for mapping arctic vegetation as a component of landscape units, and to prepare guidelines for photo recognition of some typical biophysical features in the Arctic, was completed on Melville Island (eastern half), including a collection of plant specimens and ground documentation.

#### Plans for 1974-1975

##### Pacific Forest Research Centre

Planning will continue in consultation with the Department of Indian Affairs and Northern Development for the development of a comprehensive outline of forest research and service needs in the Yukon to support effectively current and future forest operations and practices. Routine forest insect and disease survey work and fire danger rating studies will continue. Several previously established planting trials in the Watson Lake Forest Reserve will be studied more closely and a recommendation will be made concerning the value of the reserve forest as a research area.

##### Northern Forest Research Centre

The insect and disease survey will be continued in the Northwest Territories, and advice and training assistance will continue here in the forest fire protection field, knowledge accumulated during three years research will be consolidated and a terrain suitability rating developed. Some areas vulnerable to damage by pipeline or highway construction will be investigated in detail.

#### Forest Management Institute

*Biophysical Mapping of the Arctic Archipelago* — A report will be issued on the multi-level classification system for mapping arctic vegetation, as a component of landscape units, illustrated with 1:50,000 and 25,000 scale maps of Melville Island.

Guidelines for photo-interpretation of common arctic vegetation and landforms will be prepared and documented with selected stereograms, ground photographs and field notes.

#### Long-term Plans

The forest insect and disease survey will be continued in the Territories, and there will continue to be strong emphasis on participation in biophysical surveys, ecosystem studies, ecological studies of the impact of land use on environmental quality, as well as continued assistance and research in forest management, especially forest fire detection and control.

#### Canadian Wildlife Service

##### Responsibilities

To conduct research, management and administration of migratory birds under the Migratory Birds Convention Act.

To coordinate federal, provincial and territorial action on common wildlife problems.

To conduct surveys and inventories of wildlife resources.

To recommend management procedures for particular species of economic or aesthetic importance.

To undertake or to sponsor research on wildlife species in relation to their habitat.

To collect and analyse animal population and utilization data.

To study wildlife diseases and the effects of toxic chemicals on wildlife or their habitat.

#### Review of 1973-1974 Operations

##### Mammalogy Projects

Work undertaken in the North in 1973 included investigations of big game species required by the Game Management Services of the Yukon and Northwest Territories, of the wildlife and wildlife habitat on potential energy corridors in the Western and High Arctic, of the biota of areas subject to the increased tempo of petroleum exploration, of the wildlife of the new northern national parks, and of the endangered raptors and the recreationally and aesthetically valuable waterfowl resources, principally of geese. In addition, increased attention was paid to our advisory role to DIAND through the staffing of positions in Yellowknife and Whitehorse, for the purpose of providing regular wildlife input to the deliberations of Territorial Water Boards, the Arctic Land Use Advisory

Committees and the Arctic Waters Oil and Gas Committee.

Increasing petroleum exploration activity on the important Arctic Migratory Bird Sanctuaries which are administered by the Service necessitated also the staffing of a position for an Enforcement Coordinator at Inuvik.

Completion reports were prepared on studies of the effects of oil exploration on the wildlife of Banks Island, on the probable impact of summer exploration activity on the wildlife of Cape Bathurst, on the beaver and muskrat of the Mackenzie Delta, on the Dall sheep of the Mackenzie and Richardson Mountains, on the wildlife habitats of the Mackenzie pipeline corridor, including an atlas of habitat maps.

The research project on Dall sheep in the Mackenzie Mountains was concluded. Also concluded was the study in the Mackenzie Mountain area, in Zones 12 and 19, of woodland caribou with emphasis on their seasonal movements and utilization by Indians. The study of the reindeer herd in the reindeer preserve on the Mackenzie Delta was concluded in 1973 and the herds were placed in private ownership. Polar bear research continued with the emphasis on identifying the ranges of discrete sub-populations. Studies also involved documenting major denning sites and the relationship between bears and their major food supply, the seal.

Polar bear research in the High and Eastern Arctic continued with emphasis on mapping denning areas and determining numbers, distribution, movements and productivity of bears. Data were gathered in the High Arctic, James Bay, Ungava Bay and Foxe Basin.

The University of Guelph was supported in studies of the energy balance of polar bears so that the energy requirements can be related to the food supply.

Studies of distribution, numbers and productivity of muskoxen and Peary caribou were continued on Bathurst, Melville, Prince Patrick and adjacent smaller islands, and animals were captured and marked to ascertain their movements. Studies of food habits of muskoxen, Peary caribou and arctic hares on the Queen Elizabeth Islands were begun with field work on Axel Heiberg Island. Tests were conducted on Bathurst and eastern Melville Island to determine the most efficient method of extensive inventory of forage stands. It was found most feasible to measure forage productivity on small plots



and extrapolate using coloured aerial photography. The above studies are anticipatory on Arctic Islands Pipeline Survey.

A study of the potential effect of hunting by Inuit on wildlife in the new Baffin Island National Park was conducted for Parks Canada.

Field studies of the effects of forest fires on barren-ground caribou in northern Manitoba, Saskatchewan and southeastern Mackenzie District were completed.

#### *Environmental Studies Projects*

Field investigations were carried out on polar bear and seal population relationships, migratory bird use of coastal waters in the Western Arctic, the movements of the Porcupine Herd of barren-ground caribou and endangered raptor breeding sites.

An ecological evaluation of new national parks in the Northwest Territories and Yukon Territory was continued in 1973 in connection with the Parks Branch of the Department of Indian Affairs and Northern Development. The largest input in 1973 was on the Klane National Park but 1974 studies will be done in Nahanni National Park, N.W.T.

#### *Ornithology Projects*

A breeding census of lesser snow geese at all colonies around Hudson Bay, on Southampton Island and on western Baffin Island were completed by means of vertical aerial photography.

Studies of geese, conducted under contract, including continued investigations of the breeding behaviour, physiology and genetics of lesser snow geese at La Perouse Bay, near Churchill; and a preliminary investigation of the distribution of brant, snow geese and sea ducks in the western Queen Elizabeth Islands.

A complete inspection of seabird colonies along the east and north coast of Baffin Island was accomplished. Oblique aerial photographs provided a permanent record of the sites in use in 1973 and permitted counts of individuals of most of the major species. Colonies elsewhere in Lancaster Sound and north to Coburg Island were also visited and photographed.

An atlas of the distribution of birds at sea in arctic waters was begun.

A study of breeding phenology of gyrfalcons was carried out on Ellesmere Island.

#### **Plans for 1974-1975**

##### *Mammalogy*

The studies of distribution, numbers, productivity and movements of Peary caribou and muskoxen on the western Queen Elizabeth Islands will be completed. Studies of food habits of muskoxen, Peary caribou and arctic hares will continue with summer work on Bathurst and Byam Martin Islands, and winter work on Bathurst and Axel Heiberg. Subject to approval of an Arctic Islands Pipeline Survey, inventories of forage stands will begin on Bathurst Island.

Laboratory work will be completed and report writing begun on the study of effects of taiga fires on barren-ground caribou.

Polar bear studies will continue with surveys of denning areas and capture-recapture studies in the High Arctic, north and east coasts of Baffin Island, Foxe Basin, James Bay and the Belcher Islands.

New studies of territorial big game resources are being initiated in 1974. Studies of the forested winter range of barren-ground caribou in northern Manitoba, Saskatchewan and the Northwest Territories will be concluded. Emphasis will be placed on determining the long-range effects of forest fires on winter range.

Polar bear field research will continue in the Western and High Arctic, and in the James Bay region. Preliminary studies will begin in several new areas with highest priority attached to areas with increased shipping, having a high likelihood of pipeline development. Physiological studies of penned bears, bears in summer dens, and bears in winter dens will begin in the Cape Churchill area. Investigations of seal and polar bear populations in western arctic waters have been planned for 1974.

The first intensive study of the Bluenose herd of barren-ground caribou distribution, numbers, and productivity, which is found in the country between Great Bear Lake and the coast, is at an advanced planning stage. Further west, studies of barren-ground grizzly bears, commenced as an adjunct to Mackenzie Valley pipeline corridor studies, will be continued in the northern Yukon and adjacent N.W.T. as a separate project in 1974. Studies will also be carried out on the woodland caribou of the Mackenzie Mountains.

##### *Ornithology*

The census of seabird colonies will be extended to Hudson Strait and the north of Hudson Bay. The first seasonal atlas of birds at sea will be completed.

Work on the population biology of the light-bellied brant (wintering on the U.S. Atlantic coast and in Ireland) will be intensified. The species has decreased considerably in recent years and some of its nesting areas are liable to be adversely affected by oil and gas exploration.

Studies of the distribution of shorebirds and the factors affecting them will begin.

Intensive surveys have been planned for 1974 in the Beaufort Sea area, which is expected to be the scene of offshore exploratory drilling by about 1976. Surveys will include repeated aerial searches for and counts of birds at sea during the open water season. Annual surveys to monitor numbers and breeding performance of arctic waterfowl will be repeated in 1974, and, in support of this requirement, studies will be initiated into the data requirements of a simulation model of the whitefronted goose population of the Western Arctic.

#### *Environmental Studies*

The ecological evaluation of new national parks in the Northwest Territories and Yukon will be continued in conjunction with the National and Historic Parks Branch of Indian Affairs and Northern Development.

#### **Long-term Plans**

To continue studies of major wildlife resources.

To increase studies of impact on wildlife and its habitat of development of natural resources, transportation corridors and new and existing industrial processes.

To develop management regimes for important northern species of wildlife, such as caribou.

To increase efforts to preserve natural ecosystems.

To assess the effects of increasing human use, both consumptive and non-consumptive, of wildlife resources and their habitats.

#### **Inland Waters Directorate**

##### **Water Resources Branch**

##### *Hydrology Research Division*

##### **Responsibilities**

To conduct federal research programs in hydrology with emphasis on the development of hydrologic techniques and methodologies for water resource evaluation and management; to identify those operational areas in the water resource field where

There are needs for research and to implement appropriate research projects and/or programs to meet these needs; to develop and improve hydrologic models and to establish firm objective criteria for assessing their reliability; and, to gain a better understanding of hydrologic processes and interactions in order to place modelling on a more deterministic basis.

#### Review of 1973-1974 Operations

Groundwater investigations in the Mackenzie River Valley and northern Yukon were intensified in 1973 and increased emphasis placed on definition of regional groundwater recharge-discharge patterns as manifested in the hydrogeo-chemistry. Investigations on the dynamics of water movement in permafrost, the thermal effects of groundwater movements, and the implications of disturbance at the ground surface in the permafrost configuration were continued. Work on the development of groundwater instrumentation for use under northern conditions was initiated.

#### Plans for 1974-1975

Groundwater and hydrogeochemical investigations in areas underlain by permafrost in northern Canada will continue. In 1974 increasing emphasis will be placed on the engineering and environmental considerations as related to groundwater phenomena and the delineation of areas of frequent or recurring auffs occurrence.

#### Long-term Plans

A continuing commitment to investigation of northern hydrologic and hydrogeologic problems is envisaged. Two important specific aims are: (1) to gain an improved understanding of the factors controlling the subsurface occurrence and distribution of groundwater and permafrost and (2) to be able to predict how both occurrence and distribution may be modified by resource development activities with possible undesirable environmental consequences.

#### Glaciology Division

##### Responsibilities

To establish a federal research centre to provide leadership in the study of glaciology; to develop new concepts on the hydrologic processes in the North; to study the structure and physical properties of snow and ice and their relationships with the environment; to develop computerized data storage

and retrieval systems pertaining to glaciers for federal, provincial and territorial water resources agencies, educational institutions and industrial concerns; to support International Hydrological Decade (I.H.D.) projects.

#### Review of 1973-1974 Operations

Mass balance studies on I.H.D. basins continued during the summer.

A survey network was established on Fletcher's Ice Island (T-3) and the flexing and radial spreading of the ice was determined using a laser interferometer.

Work on the glacier inventory was continued, both by staff in Ottawa and through contract with the Arctic Institute to North America, on Ellesmere Island, N.W.T., and the St. Elias Range, Yukon Territory.

Hydrological conditions at the head of Vendom Fiord, south-central Ellesmere Island, N.W.T., were investigated to determine the regime characteristics of two large rivers and the nature of the ice marginal drainage system.

A team participated in the ground truth aspects of the remote-sensing program during the Arctic Ice Dynamics Joint Experiment (AIDJEX).

#### Plans for 1974-1975

The mass balance studies on the I.H.D. basins in the Arctic will continue, as will work on the glacier inventory.

The strain network on the Barnes Ice Cap, Baffin Island, will be remeasured. Depth and temperature profiles will be obtained to further explain the postulated surge of the south dome.

Additional information will be obtained on the hydrological characteristics of the Vendom Fiord area of Ellesmere Island.

#### Long-term Plans

To develop a project that focuses on the hydrological regime of basins in an environment characterized by permafrost, low temperatures, extensive periods of ice cover, etc. Increased attention will be given to a survey of calving glaciers and the rate at which they produce icebergs. Observations of the Arctic basins selected under the I.H.D. program will continue. Special attention will be given to the hydrologic implications of economic development.

#### Water Survey of Canada

##### Responsibilities

The Water Survey of Canada (WSC) is primarily responsible for the collection, computation, and publication of surface water data, including sediment data, for most of Canada. The WSC works in cooperation with provincial governments and other departments of the federal government. In addition to operating a network of hydrometric gauging stations, the WSC cooperates with other sections of the Inland Waters Directorate in the collection of water samples for quality analysis and the operation of observation wells for groundwater studies. It also constructs, operates, and maintains water level recording stations to provide information on tides and water levels for the Marine Sciences Directorate. The WSC operates laboratories for suspended sediment and bedload samples.

#### Review of 1973-1974 Operations

The WSC constructed four new gauging stations to obtain flow and sediment data. Sediment sampling was started at six stations along the Mackenzie.

Thirty-seven hydrometric gauging stations were operated in the Yukon Territory and 78 in the Northwest Territories; tidal water levels were recorded at an additional 13 stations. Sediment observations were made at 17 stations and water quality samples were collected at approximately fifty. Snow surveys were made for the twelfth year at 11 locations to assist in the prediction of seasonal runoff in the Taltson River basin, where hydroelectric power is generated.

#### Plans for 1974-1975

Plans are to continue to establish hydrometric and sediment programs and to expand by establishment of hydrometric stations in the Kluane Park area of South-western Yukon.

#### Long-term Plans

Planning of future water resource surveys in the Territories will be carried out in cooperation with the Department of Indian Affairs and Northern Development under an agreement between that department and the Department of Environment. The WSC through arrangements with the Marine Sciences Directorate, other sections of Inland Waters Directorate and other departments, will continue to observe water



levels for tidal and navigational purposes, water quality and groundwater levels.

### *Applied Hydrology Division*

#### **Responsibilities**

The main responsibility of the Applied Hydrology Division is to provide technical support for the operation of the Water Survey of Canada and includes the following functions:

- Development of techniques, instrumentation and standards for the collection of streamflow, water level and sediment data.

- Development of techniques, instrumentation and standards, including computer programming for office procedures in handling the data and publication of the resultant records.

- Conduct of Network Planning and Flow Forecasting studies.

- Conduct of special purpose or non-routine field surveys including discharge measurements of large rivers, survey of sediment deposition in reservoirs, photogrammetric surveys of glaciers and morphological studies or river basins and estuaries.

#### **Review of 1973-1974 Operations**

The annual publication of stream discharges and lake levels in the Yukon Territory and N.W.T. for the year ending December 31, 1972 was distributed on November 26, 1973. The information is also available on magnetic tape for computer use. An index of all streamflow and water level stations in Canada was published including maps showing the locations. A publication was produced in August 1973 listing records of daily sediments loads for 1969 in many streams across Canada including some in the Territories.

In the Network Planning and Flow Forecasting field, the square-grid method of estimating discharges in ungauged areas was applied to many small basins in the Mackenzie Valley in an effort to determine flood flows for design of culverts under the Mackenzie highway. Complete lack of observed data for basins of the size under study limited the usefulness of the trial.

Three Data Collection Platforms (DCP's) which transmit water levels and a variety of other data, such as temperature and recorder performance, to the ERTS 1 polar-orbiting satellite, have been operating with very high

reliability since July 1972. The three sites are:

- Mackenzie River near Wrigley
- Mackenzie River at Sans Sault Rapids
- Kasan River at Outlet of Ennadai Lake.

#### **Plans for 1972-1975**

No significant changes to the 1973 program are planned for 1974.

#### **Long-term Plans**

To continue experimentation and studies to further enhance the effectiveness of the Water Survey of Canada.

#### **Water Quality Branch**

##### **Responsibilities**

The Water Quality Branch is primarily responsible for the collection, analysis, interpretation and dissemination of surface water quality data. The objectives of the monitoring program are: to obtain baseline water quality data for industrial, municipal and private use and to provide data to assist management in the establishment of water quality standards; to study water quality trends with a view to designing methods or models for forecasting water quality conditions.

In addition, support is provided for: special projects carried out by the Department of Indian Affairs and Northern Development which conducts pollution surveillance surveys to assess the effect of mine waste-waters analytical requirements of other federal agencies.

#### **Review of 1973-1974 Operations**

A total of 1,386 water samples were analyzed for various projects (excluding the Mackenzie Pipeline Study). The number of samples analyzed for each federal agency were:

- Department of Indian Affairs and Northern Development; 671 samples were analyzed for the pollution surveillance project of the department.

- Fisheries Service; 174 samples were analyzed to assist this service.

- Canadian Wildlife Service; 20 samples were analyzed. Water Quality Branch: 501 samples were analyzed for the ongoing monitoring program of the branch.

- Other federal agencies; 20 samples were analyzed.

#### **Plans for 1974-1975**

No significant changes from 1973-1974 are planned with analytical support for other agencies to be continued.

#### **Long-term Plans**

Current plans are to evaluate all monitoring stations to indicate which stations meet national or regional criteria. These stations will be sampled quarterly for a modified set of parameters. Any expansion of monitoring programs will be implemented through cooperation and consultation with the Department of Indian Affairs and Northern Development.

#### **Water Planning and Management Branch**

##### **Responsibilities**

To develop comprehensive study and management programs for water quality and supply.

To provide an advisory service to the Governments of the Northwest Territories and the Yukon on Water Planning and Management matters.

To participate in water management aspects of environmental assessments of major developments.

#### **Review of 1973-1974 Operations**

The Engineering Division continued to act in an advisory capacity to the Mackenzie Highway Environmental Working Group which reviews and approves plans and reports on highway layout and design. An engineer from the Division also chairs a hydraulic design assessment committee which assesses consultants' designs of hydraulic structures, such as culverts and bridges. Hydrologic and hydraulic investigations involved in this work relating to adequacy of proposed culvert installations and possible effects of bridge designs are being carried out within the Division.

The Engineering Division also contributed to formulating a future monitoring study proposal for the highway and in planning and coordinating hydrological investigations which were carried out during the year in the Mackenzie Basin.

Studies carried out by the Branch with reference to proposed hydroelectric developments on the Great Bear River attempted to relate the physical considerations of the engineers to the biological considerations of the ecologists.



## Plans for 1974-1975

Activities planned for next fiscal year are similar to those above, although some active participation in a field investigation team related to monitoring studies is possible. Projected plans for the Great Bear projects are not firm at this time.

## Long-term Plans

Consideration of river basin planning in the North under consultative committees established under the Canada Water Act. Cooperate in the development of water management programs in the northern lands and coastal waters. Studies of physical and socio-economic impacts of any proposed diversions of northward flowing waters.

## ENVIRONMENTAL PROTECTION SERVICE

### Responsibilities

To take action in preventing or combating environmental problems which fall within Environment Canada's terms of reference. These responsibilities include problem surveillance, pollution control in water and air, solid waste management, control and disposal of environmental contaminants, assistance in control of activities having an ecological impact, noise control, response to environmental emergencies, and management of the federal government's own cleanup program.

To develop and enforce environmental protection regulations, codes, protocols and other protection and control instruments and to implement governmental legislation.

To serve as the point of contact for the public and other government departments with Environment Canada on matters relating to the implementation of environmental protection measures. With regard to the North, the points of contact are located at headquarters in Ottawa and at the newly established district offices in Whitehorse and Yellowknife reporting through the regional offices located in Vancouver and Edmonton respectively.

## Pollution Control

### Responsibilities

To exercise responsibility under the federal Clean Air Act, including responsibility for controlling air pollution from industrial works, businesses and undertakings in the Northwest Territories and the Yukon,

and responsibility for controlling air pollutants that may be a significant danger to health.

To exercise a leadership role in the national effort to abate air pollution.

## Review of 1973-74 Operations

The air pollution aspects of several activities in the North were investigated. These activities included gold smelting operations in Yellowknife, proposed offshore oil- and gas-drilling, waste disposal by incineration, and a proposed mining operation and power plant at Strathcona Sound, Baffin Island.

The National Air Pollution Surveillance Network was extended to include Yellowknife and Whitehorse, and, as a special study, carbon monoxide levels in Whitehorse were monitored to determine the effects of automotive pollutants in northern climates. This study was completed by an investigation of the effects of cold weather on automotive emissions.

Statistics from northern installations were included in a national inventory of four hazardous pollutants: lead, mercury, asbestos, and beryllium. Work continued in the development of national emission guidelines and standards for selected industrial sectors, and in the development of national air quality objectives.

## Plans for 1974-75

Air pollution aspects of various activities in the North will be investigated. Programs for the development of national emission standards and guidelines, and the determination of cold weather effects on automotive emissions, will continue. A further inventory of hazardous pollutants will be completed.

## Long-term Plans

Long-term plans for the North include the assessment of air pollution aspects of selected activities, an expansion of the National Air Pollution Surveillance Network, the continued development of national emission guidelines and standards (which will be applicable in the North) and, in general, to take action in accordance with the intent of the Clean Air Act.

## Ecological Protection

### Responsibilities

To coordinate, for specific projects, the activities of separate missions in assessing the

environmental effects of industrial exploitation of resources, and other activities having potential for environmental effects.

To cooperate in the assessment of the environmental effects of the activities of government and private industry and recommend and implement environmental control actions where appropriate.

To make available information which will help authorities make decisions based on professional environmental expertise.

Surveillance and monitoring of environmental effects due to construction and operation of federal projects, or projects having a federal involvement.

Development of codes of good practice, guidelines and regulations.

## Review of 1973-74 Operations

Coordination and assistance was provided to other services in identifying the predictable environmental consequences; development and implementation of controls where necessary; and surveillance and monitoring activities relating to various projects as follows:

transportation and communications — (Mackenzie Highway, pipeline)

northern resource exploration — (Imperial Oil artificial islands, Panarctic reinforced ice platform, various specialized drilling concepts)

resource exploitation — (Syncrude Tar Sand development, northern mining activities)

energy developments — (James Bay project, nuclear and heavy water proposals)

land use — through the district offices, continuing advice to the Land Use Advisory Committee, and participation in the Sub-Committee on quarrying regulations and solid waste control.

In association with foregoing, Ecological Protection staff cooperated with other government departments and agencies, as and when, required in order to develop and implement control programs and to carry out surveillance and monitoring activities.

## Plans for 1974-75

Participation in further definition of the study needs, their implementation and evaluation in developing guidelines and controls for offshore hydro-carbon exploration.

Assistance will be provided in the statement of ecological protection requirements for developmental projects and activities such as roads, pipelines, airports, hydro projects, surface mining activities, and resource identification. An environmental assessment of the remaining portion of the Dempster Highway will be carried out.

Ecological protection requirements for federal projects in the North will be assessed, and surveillance and monitoring requirements established and implemented in cooperation with other government departments and industry.

Further development of regulations, guideline and codes of good practice as needs are identified. Provide advice to the Yukon territorial government on a proposed environmental Protection Anti-Litter Ordinance.

#### **Long-term Plans**

Participate in environmental appraisal activities as necessary to fulfil Ecological Protection Service's responsibilities.

Ensure compliance with standards recommended for the protection of the environment.

Acquire environmental engineering baseline data to enable the appraisal of the environmental consequences of an action or activity.

Surveillance and monitoring of artificial island construction, offshore drilling and other related activities in northern areas.

Surveillance and monitoring of pipeline and highway construction and operation.

Appraisal, development and implementation of control requirements, and surveillance and monitoring of mining activities, particularly for northern areas.

#### **Federal Activities Protection**

##### **Responsibilities**

In consultation with other federal departments, Crown corporations and the territorial governments, to develop a cleanup program, assess environmental problems, determine courses of action, recommend annual government-wide priorities to Treasury Board for allocation of cleanup funds to other departments, provide environmental engineering service and advice and ensure implementation of remedial measures for environmental problems attributable to federal activities and installations.

In cooperation with other federal departments, agencies, Crown corporations and the territorial governments, to ensure all

proposed new federal activities and installations incorporate and maintain effective provisions for environmental protection by instituting systems for: screening proposed projects for potential adverse environmental effects; provision of environmental engineering and other technological services, assistance and advice; and the conduct of monitoring and surveillance of the on-going operations and installed environmental protection systems and prescribed practices.

On request, to provide technical advice on the environment to the governments of the Northwest Territories and the Yukon Territory.

To establish and maintain communications with the officials and agencies of two territorial governments, other federal departments, agencies and Crown corporations with which the branch deals.

#### **Review of 1973-74 Operations**

The federal government undertook in 1972 a program for the cleanup of existing environmental problems attributable to federal activities. A central fund was provided from which allocations would be made in accordance with recommendations which the Department of the Environment would develop in consultation with other departments. A sum of 12 million dollars for all of Canada was reserved for 1974-75. Recommendations to Treasury Board include proposals for bio-engineering assessments and detailed designs for a number of projects in the North for which construction will be undertaken in 1974-75 and 1975-76.

Technical assistance was provided to federal departments, Crown corporations and agencies in the identification, assessment, and implementation of remedial measures concerning environmental problems associated with federal activities. Specifically, the Whitehorse office carried out an assessment of the Canal Road debris for cleanup purposes, and participated in a sewage treatment and disposal study for the City of Whitehorse.

Considerable emphasis was also placed on waste water handling, collection and disposal of solid wastes and treatment systems applicable to the northern federal installations. Equipment has been purchased for the assessment of low water use and recirculating toilets to be used in conjunction with an incinerator. The pilot project is being carried out at a work camp near Fort Simpson in conjunction with the Department of Indian Affairs and Northern Development and the

Department of Public Works. In addition, a study is being performed on an independent physical-chemical treatment system and on a small "package" unit which utilizes the rotating biological surface concept. Results of such studies will provide valuable information in determining the most suitable waste water treatment methods for northern federal installations.

Guidelines and codes of good practice, based on the best practicable technology, are being developed to minimize adverse environmental effects associated with federal activities in the North. Guidelines for environmental protection in federal programs involving campsites, airports and townsites are in preparation.

#### **Plans for 1974-75**

Activities related to cleanup and prevention of environmental problems will be continued with additional emphasis on the review and assessment of new projects undertaken by the Federal Government. Surveillance of existing environmental control facilities will be continued with stress placed on optimum operation of the facilities.

Studies initiated in 1972 to determine most suitable methods of waste handling, treatment and disposal in the North will be continued.

#### **Long-term Plans**

Long-term plans are intended to ensure that all federal activities and installations function in a manner consistent with a role of leadership in environmental protection and that they are in compliance with standards, guidelines and codes of good practice with respect to protection of the environment. Efforts will continue to be directed towards solving the unique environmental problems in the North that are associated with federal activities. Special emphasis will be placed on applying new technology to reduce environmental degradation to the lowest extent possible in order for the federal government to demonstrate leadership in the field of environmental protection.

#### **Water Pollution Control**

##### **Responsibilities**

To coordinate EPS programs with the Department of Indian Affairs and Northern Development and two Territorial Water Boards, and to implement water quality programs in the North.



To carry out pollution control water quality management projects under the Canada Water Act.

To implement water pollution abatement programs, including those covered by national effluent regulations under the Environment Fisheries Act.

### Review of 1973-74 Operations

In conjunction with the regional office at Edmonton and the Northwest Territories District office at Yellowknife, Water Pollution Control programs of monitoring/surveillance have been initiated, and discussions with the territorial governments and Territorial Water Boards have commenced. Biological and engineering surveys of potential mines are proceeding, as well as negotiations for pollution abatement where necessary. A baseline aquatic survey of Anvil Lake's tailings pond receiving water was completed. An inventory of well sites, waste disposal and treatment methods, and toxicity tests of drilling chemicals is underway. In cooperation with the petroleum exploration company concerned, staff have been stationed periodically at artificial island drilling sites to oversee activities and to conduct engineering investigations to establish the best practical treatment. Offshore drilling activities in the Beaufort Sea have been reviewed and comments have been submitted as part of the Beaufort Sea Environmental Study program. Papers on Inuvik, Echo Bay and Canadian Tungsten Mines have been prepared for consideration of the Territorial Water Board. Discussions have been held with consultants and government representatives with regard to the proposed utility distribution system for Beaufort Bay. With the establishment of the Yellowknife office, a considerable number of contacts have been established and discussions with regard to Water Pollution Control activities have been carried out.

### Plans for 1974-75

It is intended to proceed with biological and engineering surveys of the mines in the Yukon Territory. Baseline aquatic surveys are planned for receiving waters surrounding the Keno Hill mine, and Clinton Creek, and at two new mining operations — MacTung and MacTung. A baseline survey is planned for the site of the new mine on the Anni River, and waste treatment facilities will be reviewed with other territorial agencies with responsibilities in the field. Surveillance of water pollution from

new mines will begin as required. By the end of the year, it is hoped to receive assurance of effective anti-pollution measures from all mines in the Northwest Territories.

With respect to oil and gas exploration, it is planned to inspect well sites, to examine waste effluents and the treatment process conditions under which they are produced, to evaluate the effect of wastes on the receiving water, to conduct toxicity tests on drilling chemicals and muds, to demonstrate the best treatment technology and methods, and to persuade companies to recover and reuse waste materials.

The water basin studies conducted in cooperation with the Fisheries Research Board in the Mackenzie Basin will be continued, as well as the survey of pollution sources along the Mackenzie River and Delta. Negotiations will be held with towns and industries along the River to curb their discharges of waste.

A review of the environmental design as part of the proposal by Northern Canada Power Commission to raise the level of Marsh and Tagish Lakes in the Yukon will be made.

### Long-term Plans

Future plans include the investigation of all waste treatment facilities under construction, completion of the investigation of mines in the Yukon Territory, and the beginning of regular monitoring of effluents. Further basin studies on the sources of pollution are being considered, with priority being given to the Great Slave Lake area. With the increase of industrial activity in the North, particularly with respect to energy and resource development, it is planned to accelerate the arctic waste water disposal and waste water technology development program. Projects examining waste disposal and waste water treatment processes are being considered for industrial sites and offshore locations, as well as population centres.

Ultimately, the Water Pollution Control program plans to have in effect a comprehensive advisory and surveillance program by means of site monitoring together with a communications network combining government agencies, municipalities and industry.

### Environmental Emergencies

#### Responsibilities

To integrate contingency planning.

To coordinate the development of environmental emergency technology.

To coordinate when required, a federal response to requests for assistance resulting from environmental accidents.

### Review of 1973-74 Operations

Provide leadership, guidance, and technical advice on environmental matters to other departments and agencies, provinces and territories, and industry. A national system for reporting and alerting the appropriate authorities to an emergency situation has been implemented. The research and development program published guidelines on the use and acceptability of oil spill dispersants, and continued to improve preventive measures, develop and test new equipment and techniques, and ensure that field operators are trained. On-line computer systems have been developed to support operations and analysis of emergencies. Several fuel spills and other material spills in the North were investigated. The Whitehorse office participated with the Yukon Emergency Measures Organization in drafting a new disaster plan.

### Plans for 1974-75

To follow and further develop existing arrangements.

To further examine technological development aspects of northern environmental emergency operations.

To implement computer support systems for the territorial government, MOT, DIAND, and Environment Canada to assist these agencies in responding to environmental emergencies.

### Long-term Plans

Long-term plans include the development of a national contingency plan to serve as a broad structure, and within which individual contingency plans can be integrated for mutual advantage. It will also include development of technology and training programs, as well as computer systems for support of environmental emergency operations and analysis.

## PLANNING AND FINANCE SERVICE

The Planning and Finance Service provides a variety of support facilities for the line Services of Environment Canada, including information, computing services and personnel. The responsibilities of three of its directorates however have some direct relevance to the North and a brief report on each follows.



## **Liaison and Coordination Directorate**

### **Responsibilities**

This Directorate coordinates environmental and natural resource activities of an inter-service nature in negotiations or conferences involving other departments of the Federal Government, provincial governments, governments of other countries, and international organizations. For other departments, governments and agencies, it serves as a central point of contact within the Department of the Environment at the program and policy level, and provides the contact point to facilitate the conduct of new or ongoing activities. It collaborates with other Services of Environment Canada to assist in formulating broad policy.

The Directorate's activities are generally national or international in scope, but there are specific responsibilities related to the North, particularly that of coordinating representation from Environment Canada on ACND and its various sub-committees. There are also northern aspects to a number of environmental issues raised in bilateral and international discussions, including activities which involve the United States.

### **Review of 1973-74 Operations**

Preparation of a Canadian response to the declaration and recommendations of the United Nations Conference on the Human Environment was carried out in concert with a representative from each province assigned to a federal-provincial task force for this project. Its examination and assessment of the implications of the principles and recommendations agreed to at the conference include a consideration of northern issues.

The Man and Resources Conference, under the sponsorship of the Canadian Council of Resource and Environment Ministers was held in Toronto, Ontario, November 18-21, 1973. The conference was the climax of a process which identified resource issues of concern to Canadians. Citizen groups from across Canada, including the Yukon and Northwest Territories participated in this exercise which had, as its objective, the promotion of debate concerning the formulation and recommendation of guidelines to achieve and sustain an optimum balance of social and economic benefits derived from the natural resource base.

During the year under review the Directorate carried out its continuing role of

coordination of Environment Canada's representation and participation in the activities of the Advisory Committee on Northern Development.

## **Policy, Planning and Evaluation Directorate**

### **Responsibilities**

This directorate is concerned with the overall policy structure, strategies and planning systems of the department. While the major responsibility for the North falls within the mandate of the Department of Indian Affairs and Northern Development and while a different legislative base is used to administer the Territories than is the case in the provinces, the concern of the Policy, Planning and Evaluation Directorate is whether policy, that is applicable in the provinces, is also applicable in the North.

It is the responsibility of this directorate to provide advice to management concerning the department's need for policies as they might be required to promote and assist the work of the department as a whole and its individual service segments. In the sense that the North may be different in many respects, policy intended for the provinces may not be directly applicable and consequently this directorate keeps itself aware of activities of government in the North and the decisions taken by government regarding the North, e.g. mineral exploration, energy corridor developments and wildlife preservation.

### **Office of Science Advisor**

#### **Responsibilities**

To provide advice on the science policies and the effectiveness of scientific activities of the Department.

To study the need for and application of scientific and technical information, as it relates to the environment and the use of renewable resources, in the industrial and social activities of Canadians.

To explore and develop new techniques for obtaining and relating scientific knowledge of the environment and its effect on human activities.

To provide perspectives and scenarios on the possible consequences of natural and/or man-caused changes and influences in the Canadian and world environment, and their potential effects on resources use, prosperity, and way of life. To communicate and coordinate information on the environment and resource use, and to relate such information

to the programs and responsibilities of the Department.

### **Review of 1973-74 Operations**

In 1973, the Office of Science Advisor undertook the following activities with specific northern or arctic content:

On behalf of Canada, in the fields of atmospheric science, hydrology, marine and aquatic biology, oceanography, and ecosystems studies for the Canada-USSR General Exchanges Agreement Memorandum on Cooperation in Arctic Science; took part in the discussions and negotiations with USSR authorities on these themes;

Coordinated the contribution, on environmental matters, for discussion, through the Advisory Committee on Northern Development, with the United States Interagency Arctic Research Coordinating Committee;

Coordinated the federal environmental interests in activities of the Sub-Committee on Science and Technology the Advisory Committee on Northern Development, in particular with regard to the development of guidelines for northern research and the evaluation of need for, and support of, a bibliography of arctic information;

Contributed to the information on the effects of energy activities on the environment of northern Canada, as part of the analysis of energy policies for Canada.

### **Plans for 1974-75**

Preparation of an identified plan for northern science thrusts in environmental studies.

Continued coordination and analysis of science and technology programs related to the environment in northern Canada and the polar regions.

### **Long-term Plans**

The long-term plans of the Planning and Finance Service are to fulfil the above responsibilities as they pertain to departmental undertakings in the North.

### **Mackenzie Valley Pipeline Corridor Studies**

Environmental studies are being conducted in a corridor extending from Fort Simpson to Fort McPherson. Branches will extend from Fort McPherson west through the Porcupine drainage area, northward

ong the west side of the Mackenzie delta, and from there westward along the Yukonctic coastline.

#### Review of 1973-1974 Operations

##### Atmospheric Environment Service

An investigation of snowcover in the Mackenzie Valley is continuing. Information on the extent, quantity and physical characteristics of the snowcover is being collected and analysed. A mesometeorological study of the Norman Wells area is continuing. The study will provide the meteorological information needed for decisions regarding the location of townsites, airports, pumping stations, etc. A contract has been let for a study of the low-level processes affecting the dispersion of pollutants and the formation of ice fog.

##### Environmental Management Service

##### Land Directorate

The environmental assessment of the Mackenzie Highway which began in 1972, continued and was expanded in 1973-1974. The Land Evaluation and Mapping Branch provided assistance in coordinating Department of the Environment inputs, in evaluating and reviewing route location and design documents, in developing procedures and requirements for data acquisition and assessment, and in identifying the need for further environmental studies.

During 1973 contributions were made to the Social Environmental Program report to the Task Force on Northern Oil Development.

##### Canadian Forestry Service

A preliminary report on the initial 32,400 square miles of vegetation mapping was completed as was mapping of the remaining 100,000 square miles of the Corridor. A draft report on the latter map production and a report specifically on the forest resources in the Corridor, are to be completed this fiscal year.

##### Canadian Wildlife Service

After a broad assessment of wildlife habitat quality throughout the Mackenzie Valley and Northern Yukon in 1972, the Service investigated population levels and habitat in more detail along the proposed Mackenzie Valley gas pipeline and highway corridor. Particular emphasis was placed on the species and their habitats which were the focus of potential conflicts such as

peregrine falcons, Dall sheep, grizzly bears, snow geese and barren-ground caribou. Behavioural and movement patterns of most species were also surveyed.

The main objective of the 1972 and 1973 studies was to establish a sufficient resource data base to allow adequate analysis of the ecological implications of activities related to the construction and maintenance of an underground gas pipeline.

##### Inland Waters Directorate

###### *Glaciology Division*

Research continued into hydrologic aspects of northern pipeline and highway development. Studies included estimation of flood and seven-day delay discharges for culverts; examination of river scour, ice jamming and backwater effects; delta bank erosion; distribution and significance of semi-permanent snow beds and simulation of active layer thicknesses in the North.

###### *Water Survey of Canada*

In addition to its regular hydrometric program in the Yukon Territory and Northwest Territories, stream gauging and sediment discharge data were collected for special cooperative projects with other government agencies. One example is the determination of the seasonal distribution of flow through the Mackenzie Delta, undertaken in co-operation with Glaciology Division. New and revised techniques were also tested for gauging large rivers utilizing tellurometers for distance and fathometers for depth.

###### *Hydrology Research Division*

The evaluation of groundwater and permafrost conditions was continued along proposed pipeline routes from the Arctic through the Mackenzie River Valley in order to identify special hydrogeological situations affecting design construction and operation of pipelines.

###### *Water Quality Branch*

During the 1973 season, 360 water samples and 49 sediment samples were analyzed in connection with Mackenzie pipeline studies.

A joint project to study the impact of experimental oil spills in the Mackenzie Delta in cooperation with the Fisheries Research Board was begun with two spills in August 1973. An automated water quality monitor station suitable for remote locations

in the Arctic is in place at the experimental site on the Delta.

#### Plans for 1974-1975

##### Environmental Management Service

##### Canadian Forestry Service

A final report on the Corridor vegetation mapping project will be published.

##### Canadian Wildlife Service

Assessment of an application to construct a gas pipeline is expected to be the principal activity in 1974. Concurrent investigations of grizzly bear, Dall sheep, barren-ground caribou and peregrine falcons will be carried out to obtain more basic distributional and behavioural data. Relevant information will be used in assessing design and construction proposals for the Mackenzie Highway.

##### Inland Waters Directorate

Programs of the I.W.D. will continue at reduced funding levels.

## DEPARTMENT OF EXTERNAL AFFAIRS (EA)

The Department of External Affairs is concerned with activities in the North conducted on behalf of or in cooperation with foreign governments or their agencies. A member of the Advisory Committee on Northern Development (ACND), the Subcommittee on Northern Transportation and other sub-bodies, the Department provides advice on matters having foreign policy implications, maintains a co-ordinational and operational role in matters of international law and policy relating to the Arctic, and has responsibility for the negotiation of agreements with other countries arising out of current or proposed activities in the North.

There is no single division within the Department of External Affairs charged with control of operations relating to the Arctic; rather a number of different divisions handle different aspects of the situation.

The *Scientific Relations and Environmental Problems Division (ECS)* co-ordinates scientific activities of foreign governments or their agencies in the Canadian Arctic and provides advice to the ACND Subcommittee on Science and Technology on the international policy aspects of conferences, exchanges and research agreements. Recent activities include involvement in the realization of the Polar Bear Protection Convention between Canada, Norway, Denmark, the U.S.A. and the U.S.S.R. (due to be ratified late this year); conclusion of an agreement with Denmark relating to the delimitation of the continental shelf between Greenland and Canada; facilitation of joint project "Buck-shot" with the U.S. Office of Naval Research, involving simultaneous Arctic balloon launchings; and arrangements for several past and future Arctic-related international conferences, including the Symposium on Waste Treatment in Cold Climates (Saskatoon, August 1973), the SCAR/SCOR

Polar Oceans Conference (Montreal), the Third Symposium on Circumpolar Health (Yellowknife), and the XIX Congress of the International Association of Limnology (Winnipeg).

The *Transport, Communications and Energy Division (ECT)* co-ordinates departmental responsibilities in a wide variety of areas including the international policy aspects of arctic shipping, U.S.-Canada cooperation in international arctic highway construction and maintenance, co-ordination of information-gathering on worldwide arctic transportation technology, and the international aspects of the northern energy-development projects. Recent areas of activity include continuing negotiation of an agreement with the United States on the upgrading and upkeep of the Alaska Highway, consideration of the international aspects of eventual northern pipelines, and discussions with a Polish exploration group of the application of Canadian marine safety and pollution regulations to the construction of a ship designed to winter the Arctic in the ice.

The *Commercial Policy Division (ECL)* has a strong interest in the foreign - policy and especially foreign - investment aspects of commercial and industrial developments in or related to the North, such as joint developments in ice-breaker technology or foreign interests in northern mineral projects such as the Strathcona Sound lead-zinc site.

The *Bureau of Legal Affairs (FLP)* through both its advisory and its operational branches, is instrumental in co-ordinating international legal aspects of Northern operations, including contact with foreign operators on the application of such existing legislation as the Arctic Waters Pollution Prevention Act, advice to other divisions on

the proper forms of agreement for bilateral arrangements covering such areas as joint Canada/U.S. Northern highway development, and, through its central role in Canada's Law of the Sea activities, institution of a coherent and internationally recognized legal regime for the Canadian control and development of archipelagic and continental margin Arctic resources.

The Department of External Affairs also deals with exchanges of scientists, senior foreign editors or other media personnel and foreign government officials who wish to tour the Arctic; this process is facilitated with the aim of encouraging the expansion, among the foreign public, of knowledge of Canadian Arctic developments, and of inducing an interchange of ideas on methods of dealing with problems peculiar to arctic areas all over the world. Abroad, the posts maintained by the Department of External Affairs attempt to facilitate the travel and edification of Canadians wishing officially or privately to examine governmental and non-governmental practices in northern areas of foreign nations; the missions also gather information on such topics for the use of various government departments and agencies in Ottawa. Responsible offices in this area include the *Information Division (FAI)*, the *Northwestern European Division (GEC)* which covers the Nordic nations, the *United States of America Division (GWU)* and the *Eastern European Division (GEA)* which concerns itself with the co-ordination of exchanges, including those related to the Arctic, under the General Exchanges Agreement between Canada and the USSR. Major recent activities in this field include organizational work for the Canadian study group which examined the life of the indigenous peoples of Greenland and northern



Scandinavia during the late summer of 1973; facilitation of the visits of the Danish Minister of Greenland Affairs and the Norwegian Foreign Minister for talks primarily on northern cooperation, and the co-ordination of a study on the legal rights of the aboriginal peoples. In the field of scientific cooperation in the Arctic under the Canada-U.S.S.R. General Exchanges Agreement, Canadian and Soviet experts held their third round of meetings in Moscow in February/March 1974 and continued their discussions on various programmes of joint activities which might be carried out in the North; those relating to social research and education in northern regions remain to be discussed and agreed to by the two sides.

The *Division of Cultural Affairs (FAC)* has also been responsible recently for the worldwide exhibition of travelling collections of Canadian art, including four collections of Eskimo prints which have been shown in prestigious galleries in Denmark, Norway, Belgium, Cuba, Jamaica, Trinidad, Yugoslavia, Mexico, France, China and Japan, and *en route* this year to many additional centres in South America, the Pacific, and Europe.

The Department of External Affairs will continue to maintain its interest and activities in the international aspects of private and governmental activities in the North.

## DEPARTMENT OF INDIAN AFFAIRS AND NORTHERN DEVELOPMENT (DIAND)

### INDIAN AND ESKIMO AFFAIRS PROGRAM

#### YUKON TERRITORY

##### Responsibilities — General

The Yukon has headquarters in Whitehorse with a regional director responsible to Ottawa for all programs. These programs are as follows:

- community affairs
- education (employment and relocation, adult education and vocational training)
- economic development

##### Community Affairs Branch

##### Responsibilities

To administer sections of the Indian Act that have general application to all Indians, and in particular those sections that apply to Indian reserves. There are six Indian reserves in the Yukon Territory although only two of them at Carcross and Teslin are occupied. The applicable sections of the Indian Act that are generally administered in the Territory are those referring to membership, band councils, management of Indian monies, estates, and other related matters.

The Social Assistance Program is the full responsibility of this branch and three field officers cover the Yukon region. Social assistance is administered under the same regulations and on the same scale as applies to other residents of the Yukon.

At present the child care program is administered by the Yukon Department of Health, Welfare and Rehabilitation and is administered in accordance with the applicable territorial ordinances. All direct costs

up to \$10,000 a year, including administrative costs, are charged back to the Community Affairs Branch for the care of registered Indian children.

##### Review of 1973-74 Operations

This branch participates in two types of housing programs for registered Indians: the Off Reserve Housing Program, which assists status Indians who are gainfully employed to move into established communities; and the Subsidy Housing Program where the branch constructs homes on lands set aside for Indians.

The main program in 1973 was the subsidy housing program with 32 homes being constructed and 38 housing units undergoing repairs.

New community halls were constructed for the Kluane and Liard River Bands. A new band office was provided for the Whitehorse Band and the Atlin Band. Material was obtained for a new office for the Mayo Band which will be constructed in the spring of 1974.

The labour for a large portion of the repairs program was financed with the help of the Local Initiatives Program, Department of Manpower.

A washhouse which provides shower and laundry facilities was constructed for the Whitehorse Band. The water line was extended from the City of Whitehorse to the washhouse with outlets provided for fire protection.

The Contributions to Bands' Program was extended to include all Bands in the Yukon in 1972. An even broader expansion of the program is being planned for implementation in 1974. Implementation of this broader program will enable Bands in the Yukon to participate more effectively in

matters of special concern to Indians in the Territories such as: management of lands or income accruing to Bands on settlement of land claims; Band membership responsibilities; treaty obligations and questions of Indian cultural identity. The Yukon Native Brotherhood has been very active through the field worker program which helps in providing a link between regional staff, Band staff and Brotherhood staff. In addition the Yukon Native Brotherhood has taken over and expanded the Community Development Program and have developed an arrangement with Manitoba Indian Brotherhood for training seminars to upgrade the calibre of services they are providing.

##### Plans for 1974-75

The Band Management section of the Community Affairs Branch continues to provide encouragement for local government among all Bands in the Region. CORE FUNDING is to be introduced April 1, 1974, which will provide funds to Bands based on a population formula. It is anticipated that three Bands will administer their welfare program and six Bands will take over local administration of various segments of departmental programs such as sanitation and wood. We also anticipate six Bands will administer their capital housing program in 1974.

Training sessions for Band staff and Band Councils will continue throughout the year to further encourage the autonomy of all Bands.

Twenty-eight new homes will be constructed through the subsidy housing program. Major renovations and repairs will also be carried out to Indian homes as well as three of the community washhouses. A few houses at Dawson City and Mayo are to receive water and sanitation facilities in the

ing of 1974. The community washhouse will be constructed at Ross River and new offices are scheduled for Old Crow, Inuvik, and the Kluane Bands. Major grading of community halls will be carried out at Old Crow, Aishihik/Champagne and Inuvik.

The consultants report has been received regarding the relocation of the Whitehorse Indian Village and this report is now being studied in detail to determine whether the project should proceed as the basis for carrying the project forward.

#### Education Branch

While the Yukon Government Department of Education is responsible for the education program for all school-age children in the Territory, the Department of Indian Affairs and Northern Development is involved in providing a variety of related services for the Indian population.

#### Responsibilities

The Department assists the Yukon Government Department of Education in matters related to Indian student enrolment at both elementary and secondary schools, processes applications from Indian students attending Yukon Hall, a departmentally-funded student residence at Whitehorse, provides information and other data required on Indian students.

The Department also provides funds for students to arrange boarding home care, either partial or total, for students without access to regular school services, students recommended by school authorities, and students whose parents or guardians are migratory for most four months of the year.

The Department also provides funds for students to attend educational institutions either in or out of the Territory; to purchase books and supplies; and to cover tuition fees, approved school activities, monthly allowance and transportation and living expenses.

Students are given assistance in finding part-time and summer employment through various agencies and the Opportunity for Youth Program.

In isolated areas where students require a service, the Department lets contracts for transportation services. These contracts are awarded primarily to local Indian residents.

Employment and relocation services are provided to assess the skills of the Indian labour force, recommend training programs and assist in obtaining employment. The

Department maintains contacts with Manpower, vocational training institutions, the Yukon Native Brotherhood and other interested agencies to develop and improve training facilities. Counselling services are provided to both employees and employers to ensure mutual understanding, and counselling services are also provided to the Indian population in connection with the Off-Reserve Housing Program.

The Department also provides financial assistance to students attending university, vocational schools or other institutions where such assistance is not available from the Yukon Territorial Government.

Financial assistance is available on a per capita basis for the development of Cultural/Education centres supported by Indian bands.

#### Plans for 1974-75

In accordance with the Department's policies, efforts will be made to encourage and support increased parental participation in PTA and kindergarten programs, to provide improved employment counselling services to parents, and counselling and orientation to students who must leave their home communities to continue their education.

There will be employment opportunities for students during the summer so that they may develop self-reliance, and mental, physical, emotional and social health. Students will be encouraged to discuss their problems freely in order to discover appropriate solutions.

In cooperation with Canada Manpower, the Department will institute the "Outreach Program" in Yukon communities, and will promote the utilization of Manpower programs such as training-on-the-job and L.E.A.P.

A cultural-education centre is expected to be established in the Yukon during the coming year.

#### Economic Development Branch

##### Responsibilities

In cooperation with the Indian people, other government agencies, private firms, organizations and individuals, to plan, organize and initiate a comprehensive economic development program to include logging, sawmilling, big-game guiding, fish guiding, handicrafts, trapping, fishing, commercial and industrial development, and to stimulate a steady growth of self-reliance and economic independence.

#### Long-term Plans

To promote and assist the development of economic enterprises, including small businesses and co-operatives for the Indians; to provide the supervision, managerial and training support required to establish a firm foundation for eventual economic independence in their own affairs; to improve the business relationship between financial institutions and the prospective Indian businessman, by establishing equity through the provision of grant, infrastructure and managerial assistance, where possible.

#### Review of 1973-74 Operations

##### Fishing

Fishing by Indians continues to be primarily for home consumption with commercial fishing playing a very small role.

##### Big Game Outfitting

Another successful season was completed by Teslin Outfitters Ltd., an Indian owned and operated company. All managerial functions have now been assumed by company officials and a high level of service is being offered to their customers.

##### Handicraft

Approval in principle has been given to the long term arts and crafts development proposal submitted by the Yukon Native Brotherhood and the first steps toward implementation of this program are being taken. This program is intended to provide the financial assistance and training required to create a viable arts and crafts industry in the Yukon, with emphasis on increased production and marketing.

The basis for a sound cottage industry already exists; however, outside markets will have to be developed if this industry is to make a significant contribution to the economic life of the Indian people.

##### Forestry

Two logging and one sawmilling operation are presently operated by Indians. The growing demand for forest products should contribute significantly to further development in this area.

##### Trapping

The Yukon Trappers' Association, with financial assistance from this Department, is playing a leading role in encouraging increased fur production in the Yukon. The efforts of this association in marketing furs



on behalf of trappers has resulted in significantly higher returns to the trappers.

#### **Industrial and Commercial**

During 1973 an Indian-owned retail outlet commenced operations at Burwash Landing and organization was well advanced for stores in Ross River, Pelly Crossing and Whitehorse. Financing for these ventures has been obtained.

Other businesses started or expanded by Indians during the year include a motel, delivery service, trucking services and construction operations.

#### **Indian Economic Development Fund**

During 1973, approval was given to 23 loans totalling \$293,800, four contributions totalling \$15,500 and two bank loan guarantees totalling \$6,500 to a total of \$315,800. The loans and grants were used to purchase a motel, for store expansion and to provide working capital for Indian people.

#### **Business Services**

The economic development staff has been increased to three people in response to the growing need for financial, technical and managerial assistance to Indian businessmen.

#### **Plans for 1974-75**

##### **Fishing**

A proposal to supply fish to local markets will be considered and a feasibility study into the commercial production of rainbow trout is planned for the summer.

##### **Big Game Outfitting and Commercial Recreation**

Preparation of a program for the development of tourist facilities is being considered. Such a program would be designed to provide financial, technical and managerial assistance for the acquisition and operation of big game outfitting areas, camp grounds, fishing lodges and similar ventures. Many Indians are obtaining seasonal employment in this field and have considerable experience in the operation of these ventures.

##### **Handicraft**

The Indian people are proceeding with the implementation of their arts and crafts program. The administrative body should be organized in early 1974 and development of the program will then proceed.

##### **Forestry**

Expansion of Liard Logging Ltd., into a full time integrated lumber producer is

presently being planned. The continuing demand for building materials places this company in a favourable market position.

The Old Crow Band has proposed reactivating the sawmill in their village to provide building logs for local housing. A contract with the band for purchase of these logs for the Department's housing program is being negotiated.

##### **Trapping**

A comprehensive program for assistance to trappers is under consideration. In addition to the present marketing operations, this program will provide financial assistance and training courses to upgrade the quality of furs produced.

#### **Industrial and Commercial**

The establishment of retail outlets in Indian villages will continue and a proposal for a central wholesale outlet to service Indian-owned retail stores is being studied.

Encouragement is being given to Indian performance of various programs operating in the villages such as house construction and fuel wood supply. This will result in a greater part of government expenditures going to the Indian people.

#### **Indian Economic Development Fund**

Direct loans from the fund are expected to decrease in the future with increased emphasis on guaranteed bank loans and other outside financing. An increased demand for contributions from the fund to provide managerial assistance is expected.

#### **Business Services**

Increased emphasis is being placed on the provision of managerial assistance to the Indian businessman. Improved financial controls and increased consultation with qualified business advisors are required in the initial stages of these operations.

### **NORTHWEST TERRITORIES**

#### **Responsibilities**

- To assist the registered Indian people of the Northwest Territories in social, economic and community development, in close consultation and collaboration with the Government of the Northwest Territories and individual Indian bands.
- To assist the Indian people of the Northwest Territories to optimize their participation in educational and cultural development programs.

- To assist the Indian people of the Northwest Territories with research of their Land Claim; and to establish an effective interchange of information and ideas related to Indian Affairs policies and programs.

- To establish a responsive and reliable system of consultation and awareness among all federal departments operating in the Northwest Territories regarding the needs, desires and aspirations of the Indian people, and the role that departments can play in assisting the Indian people in this regard.

#### **Long-term Plans**

Within the context of legislative and delegated authority, to:

- develop the potential and capabilities of Indian Band Councils and individuals for assuming increased responsibility in the administration and control of Band assets and resources;
- assist the Indian people in gaining and retaining control of social and economic programs operated for their benefit as far as is legislatively and administratively possible;
- foster an atmosphere of increased cultural and social self-awareness and pride in their heritage among the Indian people and increased recognition of their contributions to the Canadian community as a whole; and
- encourage and initiate multi-lateral exchanges of opinion, information and advice concerning government programs with the Indian people to ensure that the interests of the people are fairly and accurately represented and safeguarded.

#### **Review of 1973-74 Operations**

Economic Development activity related to utilization of the Indian Economic Development Fund has increased dramatically. Through joint efforts by the Indian/Eskimo Affairs Program and the N.W.T. Government, resource harvesting, tourism and transportation ventures of considerable magnitude have been facilitated for Indian people. A substantial increase in interest among the Indian people in respect of participation in business has developed, both at the Band and at the individual level.

During 1973 the Indian Economic Development Fund processed 11 applications and provided \$674,000 in loans and

27,250 in grants to a total of \$801,250. The loans and grants were used to purchase equipment, to assist in establishing a restaurant, for store expansion and to provide working capital for Indian people. Part of the total investment included an amount of \$500,000 to establish a highway construction company.

Consultation with Indian people and their Bands and Organizations has developed to a high degree; and good communications lines have been in place.

A Band Development agreement has been entered into with the Indian Brotherhood, and increased activity among the Indian people concerning involvement in Community Development is evident.

The first Indian Reserve in the Northwest Territories has been established at Hay River at the request of the Hay River Indian Band.

A land claim research proposal was received from the Indian Brotherhood of the Northwest Territories; and preliminary funding of research into Indian Claims has been undertaken.

#### Plans for 1974-75

Continuation and expansion of the Band Development Agreement, Intensified Land Claim research activity, and expanded and more comprehensive Economic Development services are priority items. There will be increased emphasis on Band Management training, and on operational consultations with Indian Bands.

#### PIPELINE INFORMATION — EDUCATION PROJECT

The Pipeline Information and Education Project was begun in 1972 to convey objective, credible information to people in a number of northern communities concerning the possible gas pipeline and its likely effect on the people, the communities and the environment.

The project provides an alternative to the conventional, unilateral public information program, in the development and conduct of which native northerners were involved from the outset. In April 1972, a supervising group was formed, comprising representatives of the Indian Brotherhoods of the NWT, Yukon, the NWT Metis Association, P.E., the NWT Department of Local Government, and the Federal Government.

The procedure developed by the supervising group was as follows:

- a) a native member of each community (called a Discussion Leader) would be employed to convey information in English and either Loucheux or Slavey to the members of his or her community,
- b) background information on the pipeline would be prepared by the IAND Department and provided to the discussion leaders subject to approval by the supervising group,
- c) a project manager would be hired on the recommendation of the supervising group,
- d) field work would be initiated by a two or three week workshop in which the discussion leaders would study and discuss pipeline information and relevant matters.

The supervising group determined that the project would be neutral re Treaties 8 and 11 and similar issues, and that the discussion leaders would have complete freedom to discuss any questions they chose and to define their own methods and procedures within the limitations of the broad objective and the \$100,000 budget available to support it.

The first workshop was held in August, 1972 after which the discussion leaders returned to their communities for a first round of information dissemination. A second workshop was held in Hay River in mid-December, 1972.

The program has functioned satisfactorily since its inception and a Supervisory Group decision has been taken to terminate the project at the end of the 1973-74 fiscal year. As the project's original objectives had been successfully accomplished, it was felt there was no reason for its continuance.

The native organizations involved felt continuation of the project would no longer be seen as basic information flow but promotion of the proposed pipeline.

The project terminates March 31, 1974.

#### NORTHERN NATURAL RESOURCES AND ENVIRONMENT

*Water, Lands, Forests and Environment Division*

#### Land Administration Section

##### Responsibilities

Management of the disposal of Crown lands in the Yukon and Northwest Territories, including allocations of lands for federal government programs, pursuant to the Territorial Lands Act and Regulations.

##### Long-term Plans

The long term plan is to complete the in-depth land-use studies currently in progress as a basis for formulating long-range land management objectives based on a multiple land-use concept, the whole to be supported by amended statutes, regulations, policies and administrative procedures.

##### Review of 1973-74 Operations

In fiscal year 1973-74, responsibility for administrative functions concerning the granting of leases and sales agreements for federal Crown lands in the Northwest Territories was transferred to the office of the Supervisor of Lands at Yellowknife, in line with similar authority already vested in the same office at Whitehorse. This was coupled with a delegation of signing authority to the Regional Directors of Resources to execute all land transaction documents on behalf of the Minister. During the year, work commenced on a comprehensive review of policies and regulations governing every aspect of the administration and disposal of lands in the Territories, and notable progress was made in the areas of agricultural, summer-recreational and territorial park type lands.

The program of transferring blocks of land surrounding communities to the administration of the governments of the Yukon and Northwest Territories continued. To date two block land transfers have been completed in the Yukon and fifteen in the Northwest Territories, encompassing a total of 1,453 square miles. This program is designed to enable the Territorial Governments to plan and control, in close co-operation with the local councils, the development and growth of the communities in their respective jurisdictions. All lands required in connection with continuing federal government projects, as identified by the various departments and agencies, are excluded from the transfers. In this respect some 50 square miles on the right bank of the Hay River, opposite the Town of Hay River, were excluded from the block land transfer for that community and history was made when these same lands were used to



establish the first Indian reserve in the Northwest Territories on February 26, 1974.

#### **Plans for 1974-75**

It is planned; to introduce a program of cottage subdivision developments in the Territories for lease to the general public; to introduce an interim disposal policy designed to promote viable agricultural development in the North; to transfer responsibility for land titles registration to the Territorial Governments; to initiate a program of soil survey research required for land-use classification purposes; and to continue work on the comprehensive review of policy and regulations which was instituted in 1973 and is now entering its final phase.

#### **Land Use Management**

##### **Responsibilities**

Control of the use of unalienated Crown lands in the Yukon and Northwest Territories and the protection of those lands from environmental damage as a result of use. This is carried out under the Territorial Land Use Regulations, administered by a staff in the field and a policy and planning staff in Ottawa.

#### **Review of 1973-74 Operations**

During the fiscal year 1973-74 some 350 operations were carried out under permit, ranging in scale from the building of an artificial island in the Beaufort Sea to the operation of a borrow pit. In each case the environmental impact was assessed and appropriate operating conditions were written into the permit after which the actual work was monitored as required. About 80 per cent of the work was in connection with the search for oil and gas in the Mackenzie District and in the arctic islands. After several years of application the Territorial Land Use Regulations were reviewed and amendments proposed. These should come into effect within the next 12 months.

A review has been made of certain Crown lands which are in need of clean up. Plans have been made to provide collection points for metal-scrap surplus from land use operations carried out under permit on Crown Lands.

An inventory of granular materials suitable for construction of roads, pipeline rights-of-way, airstrips, etc. has been made to facilitate an orderly management of these

resources in the light of accelerating demands.

#### **Plans for 1974-75**

Activities will include the clean up program, monitoring of environmental concerns in connection with the Dempster and Mackenzie Highways as well as possible environmental surveillance activity in connection with a gas pipeline.

#### **Water Management Section**

##### **Review of 1973-74 Operations**

The water management staff was active with the water licensing program under the Northern Inland Waters Act and Regulations. A total of 306 applications were received with 171 authorizations to use water issued and four water licences granted. Amendments were made to the Northern Inland Waters Regulations. The application fee was changed to \$10 for all projects, some changes were made as to the classifications of water use, and the circumstances under which an authorization may be granted were revised.

The staff continued to administer the Dominion Water Power Act and collect water and land rental fees for licensed hydro power developments in national parks and on Indian reserves as well as in the North.

With the increase in offshore drilling activity the water staff became more actively involved in administering the Arctic Waters Pollution Prevention Act and Regulations. Six pollution prevention officers were named, who may inspect all undertakings and to whom all violations of the Act must be reported. The Act and Regulations enable the formulation and enforcement of certain standards of construction and operation intended to prevent the deposit of waste, and the establishment of limits of liability that may be attached to any undertaking.

By Cabinet decision of July 31, 1973, the Arctic Waters Oil and Gas Advisory Committee (advisory to this Department) was designated as the body to be responsible for recommending the environmental operating conditions for oil and gas drilling operations in the North. Membership on the Committee includes officials from DIAND, DOE, MOT, N.W.T. government, and other federal agencies as required.

In hydro power development, the Northern Canada Power Commission was granted a licence for the construction of a power dam

on Aishihik Lake in the Yukon Territory. Construction is now underway and completion is expected in 1976. Plans for two more power developments, one on the Snare River, N.W.T. and one on the Great Bear River, N.W.T. are being considered.

The staff continued its inventory of hydro power potential with further investigations on major tributaries of the Mackenzie River. The Department continued its membership on the Mackenzie Basin Intergovernmental Liaison Committee. This committee was set up as a forum for information exchange and to co-ordinate joint studies on water-related resources of the Mackenzie Basin. The staff provided advice on water matters pertaining to pipelines, highways, oil and mineral development and community supply and disposal systems.

#### **Plans for 1974-75**

Water licensing under the Northern Inland Waters Act is expected to continue at a slightly accelerated pace. For more comprehensive water management, hydrometric water quality and meteorological network programs will be initiated. Installation of new stations and a re-appraisal of the existing systems will be foremost. A policy for water supply and waste disposal in the North will be required, and technical assistance will be supplied to the Territorial governments for the up-grading of facilities. The inventory of hydro power potential will continue and a comprehensive planning capability for hydro power will be initiated. Preliminary steps will be taken to initiate water resources inventory in the northern territories.

A report containing operating facts and figures on existing hydro power developments licensed under the Dominion Water Power Act will be published during 1974.

#### **Northern Forests Section**

##### **Forest Management**

##### **Responsibilities**

To manage the forests of the North using sound recognized forest management practices in conjunction with essential environmental restraints.

#### **Review of 1973-74 Operations**

In general terms, forest production in the N.W.T. remained at approximately the same level as in 1972/73 but in the Yukon there was a sharp increase in production, mainly in the Watson Lake Area. Interest in the forest



resources in both territories by major industrial firms is much more evident now than in previous years. A number of formal enquiries have been received as well as requests for forest type maps and survey reports.

One company in the Yukon constructed a new modern mill near Whitehorse and a large mill is presently being constructed at Watson Lake. The major lumber producing company in the N.W.T. is being reorganized and, although the sawmill has shut down, a native co-operative logging concern is working in the woods.

In anticipation of the start of a forest inventory of both territories about 20,000 square miles were photographed during the summer.

Work continued on the review of the Territorial Timber Regulations and a second draft was made to incorporate progressive forest management practices and authority to dispose of timber cutting rights by competitive bidding.

#### Plans for 1974-75

Completing the revised Territorial Timber Regulations and increasing the dues for rampage in line with the increased value of the end product.

Planning for the forest inventory will continue in the areas of metric conversion, procedure guidelines, sampling and classification manuals and a start will be made on the interpretation of the photography flown in 1973.

#### Long-term Plans

Long-term Plans include a Policy and Guidelines Manual for all phases of forest management conducted in the Territories. This will probably take the form of a volume chapter for each phase e.g. inventory, recreational cruising, reforestation, silvicultural practices. A second priority would be the gradual strengthening of both forest services in their forest management capacity to enable them to cope with expected increasing demands on the timber resources on one side and necessary environmental restrictions on the other.

The reforestation requirements of cutover areas will be studied and if necessary a change in the Territorial Lands Act will be proposed to provide enabling legislation to enable the industry do their fair share of forest reforestation.

### Forest Fire Management

#### Responsibilities

The protection of life, property, important timber resource areas and essential game habitat areas from wildlife with an aim to reduce forest fire damages to a level consistent with the present and future needs of the people for the continuation of their enjoyment and use of the resources.

#### Long-term Plans

Plans include reviewing the Forest Protection Ordinances, Regulations and fire management policies for both territories with a view to protecting northern residents, their interests and natural resources in the most efficient manner possible.

#### Review of 1973-74 Operations

A relatively wet fire season in the Yukon Territory resulted in a below normal fire incidence. Fire damages were further minimized as a result of organizing 48 locally trained firefighters into initial attack crews for use throughout the region. The total number of fires was 111 which burned 3,597 acres. Of that total, 92 were in the protected area and were actioned with an average burned acreage per fire of 12 acres.

An above average fire incidence in the Northwest Territories resulted partially due to drought conditions. The total number of fires was 490 which burned 2,107,297 acres. A record number of 322 fires occurred in the protected zone. These fires were actioned but the burned acreage was 1,009,881 acres because of the drought conditions and the high number of fires occurring during a very short period. Fire control operations were strengthened by the addition of nine native eight-man initial attack crews which were positioned strategically throughout the Mackenzie District. This action prevented a much more serious loss of the timber resource.

A fire Management Policy Manual was introduced to both territories during the 1973 fire season.

#### Plans for 1974/75

During 1974, policies related to the protection of life, property and resource values will continue to evolve in conjunction with organizational requirements.

Communication systems will receive further study and development in both the

Northwest Territories and the Yukon Territory. Considerable progress has been made to date.

The fire suppression capability of the Yukon Lands and Forest Service will be increased in 1974 to permit fire control operations to function more efficiently. Highly trained Sky Genie or "spider" crews have been contracted to augment the regular initial attack crews. Their duties will include rappelling to fires from helicopters, conducting backfiring operations, using explosives to construct fire lines and a variety of other specialty services. In addition, two Douglas A'26 fire bombers will be contracted for initial attack and support actions.

In the Northwest Territories a Douglas DC 6, two Douglas A'26 and three Canso aircraft will be used for fire bombing purposes. Larger, faster aircraft are being sought continuously for this important role.

#### Arctic Land Use Research Program

In 1973-74, 23 map sheets covering the western and southern parts of the Yukon Territory were prepared and published, and the baseline information was assembled for a further 17 map sheets which will complete the coverage of the Yukon. These 17 map sheets will be published in 1974. Field surveys and literature reviews will also be undertaken to compile the corresponding information for an area of the Northwest Territories between the Mackenzie River Valley and Yellowknife; the resulting maps will be published in 1975-76.

A methodology for assessing terrain sensitivity by photo-interpretation has been developed, and in 1973-74, was used in the production of terrain sensitivity maps for the following Islands: Ellef Ringnes, King Christian, Axel Heiberg (west half,) Melville (east half) and Ellesmere (Fosheim Peninsula and Bjorne Peninsula). Maps are currently being prepared for Banks Island and a three-year programme has been developed to map all of the arctic islands where oil and gas exploration activities are anticipated to occur. This work is complemented by more detailed field studies of vegetation and terrain.

Studies on fire ecology were initiated in 1973 in order to obtain scientific information on the occurrence and ecological effects of forest fires in the Northwest Territories with the objective of providing a scientific basis for management decisions on fire control. The studies will take about five years to complete.

Investigations also continued on water quality in relation to the disposal of mine tailings in a northern environment and a multi-disciplinary study of the environmental effects of removing forest cover was completed. The latter study was started in 1970 and was carried out near Watson Lake, Yukon Territory.

The ALUR Program also continued a number of studies on behalf of the Environmental-Social Program, Northern Pipelines, including investigation of: land-based oil spills, waste disposal (in co-operation with Department of the Environment), terrain disturbance and techniques for restoring the vegetation, explosion and fire hazards from pipeline rupture, and contingency planning. A preliminary archaeological survey was also continued in collaboration with the National Museum of Man. This survey and the land based oil spills and waste disposal studies will be continued in 1974-75.

In addition to the above, the preparation of a land use handbook for use by the resource management field staff has been undertaken. Assessment of the environmental impact of exploration and development activities is receiving increasing attention and will be emphasized even more in future years.

## *Oil and Minerals Division*

### **Oil and Gas**

#### **Responsibilities**

The *Oil and Gas Land and Exploration Section* provides managerial services in respect of the Government's proprietary interest in oil and gas, and to this end is responsible for the conduct of sales of oil and gas rights, the issuance of permits and leases, the maintenance or a registry of oil and gas rights, the surveillance of royalty and other revenue functions directly resulting from oil and gas operations, the economic and geological appraisal of individual parcels and the evaluation of the oil and gas potential in Canada north of 60°. It assesses exploratory programs for suitability to meet obligations to explore, receives and maintains technical data from exploration programs, maintains a library of exploration reports, and processes the geoscience data to provide information on potential reserves and land values, and to assist engineers of the Oil and Gas Drilling and Conservation Section in the solution of drilling, well control and production and conservation problems.

The *Oil and Gas Drilling and Conservation Section* is responsible for Departmental activities directed to the control of drilling and production techniques to protect against blowouts, whether polluting or simply wasteful, to ensure that reservoir depletion is carried out to ensure the maximum economic recovery of oil and gas, and its proper sharing between the various producers, and to ensure that all underground fluids not produced are confined to the strata in which they are found. It is responsible to ensure that timely recovery enhancement programs are instituted, and that adequate gas and oil treatment plants are built in accordance with good engineering practices. It is responsible for the prevention of pollution directly attributable to drilling and production operations, and for the safe gathering, storing, and transmission within the Territories of oil and gas and by-products produced from Canada Lands in the Territories and adjacent offshore areas. It is responsible for the safe conduct in all respects of drilling and producing operations in the harsh environment of northern Canada, and for the co-ordination of activities with those agencies responsible for activities peripheral to the immediate drilling and production operations.

## **Review of 1973-74 Operations**

### **Oil and Gas Exploration**

Expenditures by industry on oil and gas exploration in the Yukon Territory and Northwest Territories exceeded \$250 million in 1973, an increase of about \$12 million over the previous year. Exploratory and development drilling increased to \$173 million (up 23 per cent) while total geological and geophysical expenditures remained the same at approximately \$85 million.

Significant filing applications were being received for permits. Industry interest was centred on Victoria Island, Davis Strait area, and along the periphery of the polar ice. Applications for filing will be processed after the Canada Oil and Gas Land Regulations are amended and promulgated.

Permits were surrendered or cancelled along the periphery of many basins on the mainland and arctic islands. Significant numbers of permits were also surrendered in the Yukon and along the eastern periphery of the Mackenzie Valley Basin. Leases were surrendered in the southern Northwest Territories.

A total of 155 crew months was reported including 20 marine seismic programs in the Mackenzie Delta, in the Beaufort Sea and the Baffin Bay — Davis Strait areas. Detailed seismic work was carried out on land by Imperial Oil Enterprises, Gulf Oil Canada Limited, Shell Oil Canada and others along the Arctic Coastal Plain and in the Mackenzie Delta-Tuk areas. Five reflection seismic participation programs were initiated or continued in the Delta during the current season. In the arctic islands, major seismic programs were continued by Elf Oil Canada on Banks and Prince Islands, while Panarctic Oils Ltd. and Sunoco Company, utilizing approximately 10 seismic crews, continued large scale reflection seismic programs over most of the islands.

Seismic operations in marine tracts encountered severe ice conditions in the region of the arctic islands and most programs had to be reduced. One seismic survey was undertaken in the Sverdrup Basin areas and others were concentrated in the Lancaster Sound and Davis Strait areas. A considerable amount of marine seismic work was carried out in the Delta-Beaufort Sea and adjacent marine areas.

Drilling operations were concentrated in four areas: Eagle Plain in the Yukon Territory, the Mackenzie Delta — Tuktoyaktuk areas, Peel Plateau and the arctic islands, specifically in the Sverdrup Basin.

The first well on a man-made island in Canada was drilled by Imperial Oil in the Beaufort Sea during the current year. The well was abandoned at a depth of 8,883 feet when abnormally high formation pressures were encountered. At least two more wells will be drilled by Imperial Oil from man-made islands during the 1974 season. Approvals in principle were given to two proposals for drilling from floating vessels in offshore locations in the Beaufort Sea. The companies will now proceed with design and construction of the offshore drilling units. Two more drilling proposals are being evaluated by drilling engineers and by environmental management officials.

Gas discoveries were made in the Mackenzie Delta by Gulf Oil at Reindeer F-36; Titalik K-26; Ya Ya p-53; by Imperial at Taglu F-43; by Shell at Shell Kugpik 0-1 and Niglitgak H-30. The Shell Kugpik 0-1 well is also an oil discovery. Pacific discovered gas in their Tathlina N-18 well in the southern Territories. In the arctic islands, Panarctic Oils discovered gas in their Hecla I-69 and Thor H-28 wells and Dome in its Wallis K-62 well.



Large scale environmental and ecological studies were carried out by Canadian Arctic Gas Pipeline Ltd. along the Mackenzie valley corridor. The application to construct the pipeline was made in early 1974. Through the Polar Gas Project, Panarctic Oils Limited and others jointly continued feasibility studies on the gas pipelines from the arctic islands to the mainland. Two possible routes were proposed by Panarctic Oils Ltd. Both would cross Barrow Strait, one to proceed south along the west side of Hudson Bay, and the other along the east side of Hudson Bay. Detailed reconnoissances of both routes was made during the past year.

In 1974 large marine seismic programs are proposed for the Beaufort Sea and in the Affin and Davis Straits. A "Seadrill Operation", to core and drill is proposed for the Lancaster Sound area. A continuation of wildcat and development drilling in the arctic by Panarctic Oils and wildcat and development drilling in the Delta by the major companies will maintain the same level of exploration activity in the two areas. A significant decrease in activity will occur in the Yukon and in the area south of Norman Wells. However, total exploratory costs should maintain the same level as in 1973.

#### Oil and Gas Production

##### Norman Wells Oil Field, N.W.T.

The Norman Wells Oil Field, lying in the central part of the N.W.T. had 59 oil wells capable of production, 43 producing regularly. Total gross field production during 1973 average 2,802 BOPD, plus 4.74 Mcf/D of gas, for a yearly total of 22,722 bbls. of oil and 1,730 Bcf of gas. The water injection plant of the pressure maintenance scheme injected fresh water at an average rate of 1,504 BWPD, for a yearly total of 549,314 bbls. of water injected.

##### Pointed Mountain Gas Field, N.W.T.

Three gas wells, Pan Am Pointed Mountain K-45, P-53 and O-46 (in grid area 30-123-45) produced at a combined gross average rate of 101.6 MMcf/D plus 395.4 BWPD for a yearly total of 37,090 Bcf and 4,331 bbls. of water. A fourth well, Amoco Pointed Mountain F-38-60-30-123-45, has been completed and awaits construction of a gathering pipeline to the Pointed Mountain Gas Plant. A fifth well, Amoco Pointed Mountain A-55-60-30-123-45, was commenced in early 1974.

##### Beaver River Gas Field, Y.T.

The Beaver River Gas Field straddles the Yukon — B.C. border with one well, Pan Am Beaver River Y.T. G-01-60-10-124-15 in the Yukon portion of the field. No production was taken from the Pan Am Beaver River Y.T. G-01 well during 1973. However, under a royalty-sharing unitized pool agreement between the Government of B.C. and the Government of Canada, seven per cent of the total field production or 3.402 Bcf was assigned to the Yukon portion of the field during the year.

#### Mining

##### Responsibilities

The Mining Section which is composed of three units has the responsibility for the administration of the mineral rights in the Yukon and Northwest Territories from the acquisition of mining lands through to mineral production including safety in mines.

*Lands Administration Unit* is concerned with disposition of mining lands including recording of mineral claims, representation

**Table 1. Number of Permits and Leases, and Relevant Acreage  
31 December 1973**

Area	Permits	Acreage
N.W.T. mainland	1,770	79,905,301
Yukon mainland	488	20,775,676
Arctic islands	5,024	243,599,272
Arctic coast marine	1,310	63,413,809
Total	8,592	407,694,058
Area	Leases	Acreage
N.W.T. mainland	682	4,523,423
Yukon mainland	93	427,854
Arctic islands	Nil	Nil
Arctic coast marine	Nil	Nil
Total	775	4,951,277
Grand Total	9,367	412,645,335

**Table 2. Revenues Received, 1973**

Yukon Territory	Revenues (\$)
Permit Fees	\$ 3,500.00
Transfer Fees	Nil
Lease Fees	Nil
Rentals	417,142.38
Forfeiture	Nil
Bonus	Nil
Royalties	25,649.09
Total	\$ 446,291.47
Northwest Territories	Revenues (\$)
Licence Fees	\$ 4,100.00
Permit Fees	183,500.00
Transfer Fees	30,235.00
Lease Fees	1,950.00
Rentals	4,836,714.92*
Forfeiture	359,957.30
Bonus	Nil
Misc.	4,441.03
Royalties	750,769.46
Total	\$6,171,667.71

\*Permit Rental — Special Renewals (\$1,444,172.50)



work performed on mineral claims, the issuance of mining leases and the issuance of prospecting permits, and coal exploration licences. There are four mining recording offices in the Yukon, one in the Northwest Territories and one located at Ottawa for the Eastern Arctic.

*Engineering and Inspection Services Unit* is responsible for all engineering and technical matters pertaining to developing and producing mining operations. This includes approval of plans and specifications of mining methods, procedures, equipment, materials and products for the safe operation of mines. It also includes the inspection of mining operations to ensure compliance with safety regulations, the operation of mine rescue stations, mine rescue training and mine rescue and recovery operations as well as the monitoring of mining environment both underground, surface and in the adjoining mining townsites.

*Exploration and Geological Service Unit* provides a geological information and advisory service to those interested in mineral exploration in the Territories from resident geologist offices in Whitehorse and Yellowknife. These offices give assistance where requested to geologists and prospectors, prepare geological compilation maps and assist in prospectors' training programs. A small library contains assessment reports, technical books and mining publications for use by the public. New core libraries in Whitehorse, Yukon Territory and Yellowknife, Northwest Territories provide facilities for the preparation and study of core samples and preserve valuable core data for the mineral industry. The Exploration and Geological Service Unit also carries out geological evaluations on mining developments in the Territories where government assistance is solicited through such programs as the Prospectors' Assistance Program and the Northern Mineral Exploration Assistance Program.

## Review of 1973-74 Operations

### General

The year 1973 saw a substantial increase in value of mining production mainly owing to the increase in metal prices particularly for gold, silver and zinc. The combined value of production for the two territories increased from \$244,407,417 in 1972 to \$310,571,000 in 1973, an increase of 38.3 per cent.

Exploration activity in the North has increased substantially as a direct result of the higher prices on the world markets for base metals, gold and silver, uncertainties over British Columbian mineral legislation and improvements in the transportation network in the North.

Exploration activity ranged over a wide area, including Selwyn and Mackenzie Mountains (Summit Lake, Godlin Lake and Bonnet Plume Lake), Enadai Lake, Rankin Inlet, Baker Lake, northern Baffin Island, Dawson Range (Minto area) and Ellesmere Island. Claim staking in 1973 increased 99 per cent over 1972; 9,383 claims in the Yukon and 15,303 claims in the Northwest Territories were staked compared to 6,845 and 5,555 respectively in 1972.

### YUKON

#### Mining Production

The value of mining production in the Yukon increased from \$106,502,067 in 1972 to \$145,594,000 in 1973, an increase of \$39,091,933 or 37 per cent. This production came from six mines; four underground and two open pit mines producing lead, zinc, copper, silver, asbestos and coal with lead-zinc accounting for 67 per cent of the total production. The Yukon was the leading lead producer in Canada for the second year in a row.

*United Keno Hill Mines Ltd.* (Silver-Lead-Zinc-Cadmium) increased its milling rate from 220 tons a day in 1972 to 256 tons a day in 1973. Value of production increased substantially, mainly because of the increase in price of silver and zinc. Reserves totalled 65,000 tons (56.8 ounces of silver a ton; 6.4 per cent lead; 1.5 per cent zinc) plus 26,000 tons at 40 ounces silver a ton. Total work force throughout the year was 280.

*Anvil Mining Corporation Ltd.* operates a large lead-zinc open pit mine in the Ross River area 130 air miles northeast of Whitehorse. It is the largest producer in the Yukon with a work force of 375. Production remained at 7,942 tons a day, but this is expected to increase substantially in 1974. Total tons milled amounted to 2,899,124 with reserves of 59,940,000 tons grading 11.7 per cent combined lead-zinc, 1 ounce silver a ton.

*Cassiar Asbestos Corporation Ltd.* operating an open pit asbestos mine at Clinton Creek, 50 miles northeast of Dawson City, produced at a rate of 4,838 tons a day.

Total tons milled amounted to 1,247,154.

*Whitehorse Copper Mines Ltd.* which started production from underground in December, 1972, produced at a rate of 1,919 tons a day in 1973. Total tons milled amounted to 700,054 with reserves of 3,000,000 tons of 2.38 per cent copper. Total work force throughout the year averaged 196 persons.

*Hudson-Yukon Mines Ltd.* operated the Wellgreen nickel-copper property situated a Mile 1111 on the Alaska Highway at a rate of 460 tons a day until August 1973. The mine was shut down due to lack of continuity in the ore body and poor ground conditions. Tons milled during the operation of the mine for approximately a year and a half from May 1972 amounted to 182,847. Total work force was 57 employees.

*Tantalus Butte Coal* operated by Anvil Mining Corporation Ltd., continued mining coal throughout the year at 80 tons a day, with a total work force of 19 employees. The coal is shipped to the Anvil Mine and is used for drying lead-zinc concentrates.

#### Mining Exploration

During 1973 exploration in the Yukon consisted of underground exploration and detailed and reconnaissance geological, geochemical, geophysical and diamond drilling programs. The Summit Lake and Minto occurrences received much exploratory work to assess their potential and this work will continue. The enormous gold price increase has revived interest in the placer mining industry of the Yukon. New discoveries of zinc mineralization in the Bonnet Plume, Goz Lake areas of the territory has started a new wave of claim staking and prospecting activity. There were 9,383 mineral claims recorded in the Yukon in 1973, an increase of 2,538 over 1972.

Amex Corporation has completed underground exploration on its Macmillan Pass tungsten property. BX Development will conduct preliminary production feasibility studies and detailed metallurgical tests on its Williams Creek property.

Exploratory diamond drilling programs were carried out by Whitehorse Copper Mines and Hudson Bay Exploration and Development Company on their Whitehorse Copper Belt properties. Silver Standard Mines and United Keno Hill Exploration carried out similar work on large, good grade copper deposits discovered in the Minto area.

Canex Placer's 1973 program consisted of extensive diamond drilling, bulldozer trenching and detailed geological mapping on its lead-zinc property near Summit Lake.

Barrier Reef Mines and Cypress Resources have staked and begun exploring promising lead-zinc showings near Bonnet Plume. Discovery of base metals deposits in these particular host rock units has led to reconnaissance studies for similar deposits in the Igilivik and Richardson Mountains. Many companies will be carrying out exploration programs in this area in 1974.

## NORTHWEST TERRITORIES

### Mining Production

Production was achieved from six mines; two open pit and four underground operations producing lead, zinc, copper, gold, silver and tungsten. Lead-zinc accounted for 50 per cent of the total value of production. In the Northwest Territories was the second largest lead producer in Canada. Volume of gold production was down 18 per cent from 1972, but because of the higher price of gold the value of production was up 37 per cent. Total value of all production in the Northwest Territories was \$164,777,000 up 40 per cent over 1972.

*Pine Point Mines Ltd.* produced at a rate of 10,790 tons a day during 1973. All production was from open pit operations. Approximately 3,500 feet of underground mineral development work was completed in the M-40 ore body in preparation for underground production. Total tons milled amounted to 3,896,357. Reserves totalled 9 million tons grading 9.9 per cent combined lead-zinc. Total work force in 1973 was 550 employees.

*Con-Rycon-Vol* produced at a rate of 462 tons a day grading 0.54 ounces gold a ton. Underground exploratory work outlined 1 million tons grading 0.62 oz. gold a ton on extension of the Campbell zone. Con-Rycon-Vol planned a new shaft to mine this ore. At the end of 1973 the shaft was collared to 40 feet, a 110 foot steel head frame was erected and a 12-foot diameter sinking hoist was installed. It is expected that the shaft will be sunk to the 5,600 foot level and will be completed in two years. Total tons milled the year, 168,696. Total work force, 207 employees.

*Giant Yellowknife Mines Ltd.* continued mining at a rate of 1,067 tons a day grading 1 ounce gold a ton compared to 0.50 ounces in 1972. Ore was mined from the Lolor and Supercrest mines which

are all interconnected. Giant employs 358 men on its Yellowknife operation. Some trackless mining equipment was used to mine surface pillars resulting in lower mining costs permitting the mining of lower grade ore. Total tons milled was 389,460.

*Echo Bay Mines Limited* situated on Great Bear Lake continued to operate throughout the year at a rate of over 100 tons of silver-copper ore a day with a work force of 91 men.

*Terra Mining and Exploration Ltd.* Located on Rainy Lake, 10 miles south of Great Bear Lake, operated throughout the year at a rate of 113 tons a day with a total work force of 53 men. The mill put through almost 40,000 tons in 1973 compared to 25,000 tons in 1972.

*Canada Tungsten* continued production at a rate of 452 tons a day of tungsten ore from its open pit operations on the Flat River in the Nahanni area. Underground development work commenced on a new ore body discovered in 1972 adjacent to the open pit. A decline was driven into the ore zone and a total of 7,827 feet of lateral development was completed by the end of the year. Total work force in 1973 was 85 men, plus an additional open pit mining crew of 75 for the four month mining period.

### Mining Exploration

Mineral exploration expenditures in the Northwest Territories were up substantially from 1972, partially as a result of new discoveries of lead and zinc in the Mackenzie and Selwyn Mountains.

There were 15,303 mineral claims recorded in the Northwest Territories in 1973, an increase of 9,748 from 1972. In

addition, 39 prospecting permits were granted covering approximately 7,000,000 acres of mining land.

Considerable staking was done by Welcome North Mines and others over lead-zinc discoveries in the Godlin Lakes area; by Pan Ocean Oil over uranium discoveries in the Kazan Falls area, and by Cominco and Canadian Superior Exploration in the central Arctic Islands.

Mineral Resources International completed a feasibility study on its lead-zinc ore body on Strathcona Sound, Baffin Island and expect to bring it into production by 1976.

Arvik Mines shipped a 3,700 ton bulk sample from its lead-zinc property on Little Cornwallis Island for testing as part of a feasibility study. O'Brien Gold Mines will carry out underground exploration in 1974 on gold showings in the Cullaton Lake area.

Extensive exploration programs have been carried out by Cominco, Canadian Superior Exploration and Global Arctic Resources on their properties in the central Arctic Islands.

Exploration for copper and associated base metals continued to be widespread throughout the Northwest Territories.

The Godlin Lake, Wrigley Lake and Summit Lake areas are being extensively explored, with detailed geochemical, geological mapping, trenching and diamond drilling programs being carried out by many companies in these areas.

Continued drilling by Cominco in the Hackett River area revealed additional silver-lead-zinc mineralization as well as some occurrences of copper.

Table 3 shows preliminary production figures for 1973 and comparative figures for

Table 3. Comparison of Mineral Production 1972-73

Northwest Territories		1972	1973 (000)*
Gold	\$	17,713,250	24,262
	Ounces	307,479	252
Silver	\$	6,778,965	13,801
	Ounces	4,059,261	5,520
Copper	\$	557,416	1,064
	Pounds	1,133,767	1,669
Lead	\$	27,838,277	35,853
	Pounds	180,439,960	222,163
Zinc	\$	64,792,006	89,741
	Pounds	339,741,000	374,544
Cadmium	\$	205,436	56
	Pounds	81,200	15
TOTAL		\$117,905,350	\$164,777

NOTE: All figures are on a calendar year basis, since Statistics Canada and Mining Companies from which we obtain our figures work on a calendar year basis.

\*Preliminary value of production.



**Table 3. Comparison of Mineral Production 1972-73 (Continued)**

Yukon Territory		1972	1973 (000)*
Gold	\$	234,983	386
	Ounces	4,079	4
Silver	\$	8,331,575	15,391
	Ounces	4,988,967	6,156
Lead	\$	34,392,366	36,718
	Pounds	222,921,742	227,499
Copper	\$	890,286	13,771
	Pounds	1,748,093	21,587
Zinc	\$	45,241,287	60,536
	Pounds	237,225,560	252,654
Cadmium	\$	82,759	55
	Pounds	32,711	15
Asbestos	\$	13,006,476	14,849
	Pounds	101,888	99
Nickel	\$	3,996,762	3,888
	Pounds	2,814,621	2,541
TOTAL		\$106,502,067	\$145,594

**NOTE:** All figures are on a calendar year basis, since Statistics Canada and Mining Companies from which we obtain our figures work on a calendar year basis.

\*Preliminary value of production.

1972 for the Yukon and the Northwest Territories.

## PARKS CANADA

### National Parks Branch

#### Responsibilities

The National Parks Branch is responsible for Canada's national parks. It provides visitor services and protects natural resources. The service also examines and evaluates sites to determine their potential as national parks, recommends the establishment of new parks, and plans for the development of existing parks. There are four national parks north of the 60th parallel — Wood Buffalo in the Northwest Territories and Alberta, Kluane in the Yukon, and Nahanni and Baffin Island in the Northwest Territories. The last three were announced February 22, 1972 by Jean Chrétien, Minister of Indian Affairs and Northern Development.

With the announcement of the Byways and Special Places Program in October 1972 the responsibilities of Parks Canada were widened to include the preservation, development and operation of new types of park including marine parks, wild river parks, national landmarks, historic waterways and historic land trails all of which may find application in the Yukon and Northwest Territories.

#### Long-term Plans

- To undertake field studies aimed at identifying natural landscapes and environments in the North which are not yet represented in the national parks system. These studies are part of long-range planning which will make possible the establishment of several new national parks in Canada, before the turn of the century.
- To plan for the development of existing national parks through resource inventory and environmental studies.
- To study the effect of human activities in national parks, particularly those having an arctic environment and to conduct specific studies on visitor behaviour in the northern parks.
- To collaborate with other agencies responsible for outdoor recreation and tourism in the North so as to produce an integrated park system complementary to the objectives of the various agencies concerned.

#### Plans for 1974-75

- To undertake aerial and ground reconnaissance of the Arctic Archipelago with a view to determining areas within the High Arctic worthy of more detailed study as possible future national parks, national landmarks or national wild rivers. Detailed

studies of potential areas in Ellesmere, Devon and Axel Heiberg Islands (identified in 1972) will also be carried out during this field project.

- To carry out field examinations of the Firth River region, Yukon Territory to determine and document national park values of this area as were reported during the national wild rivers study here.
- To continue informal liaison (as required) with U.S. officials concerning Alaskan wild river studies and national park studies, with particular emphasis on those areas lying along the Yukon-Alaska International Boundary.
- To finalize review of data collected during the 1971-72-73 wild rivers study (which included several northern rivers) and to select a representative sample for inclusion in a system of national wild river parks.
- To propose the establishment of new park areas meriting protection under the National Parks Act.
- To advance the planning and operation of existing national parks.

### Future National Park, Great Slave Lake, N.W.T.

#### Review of 1973-74 Operations

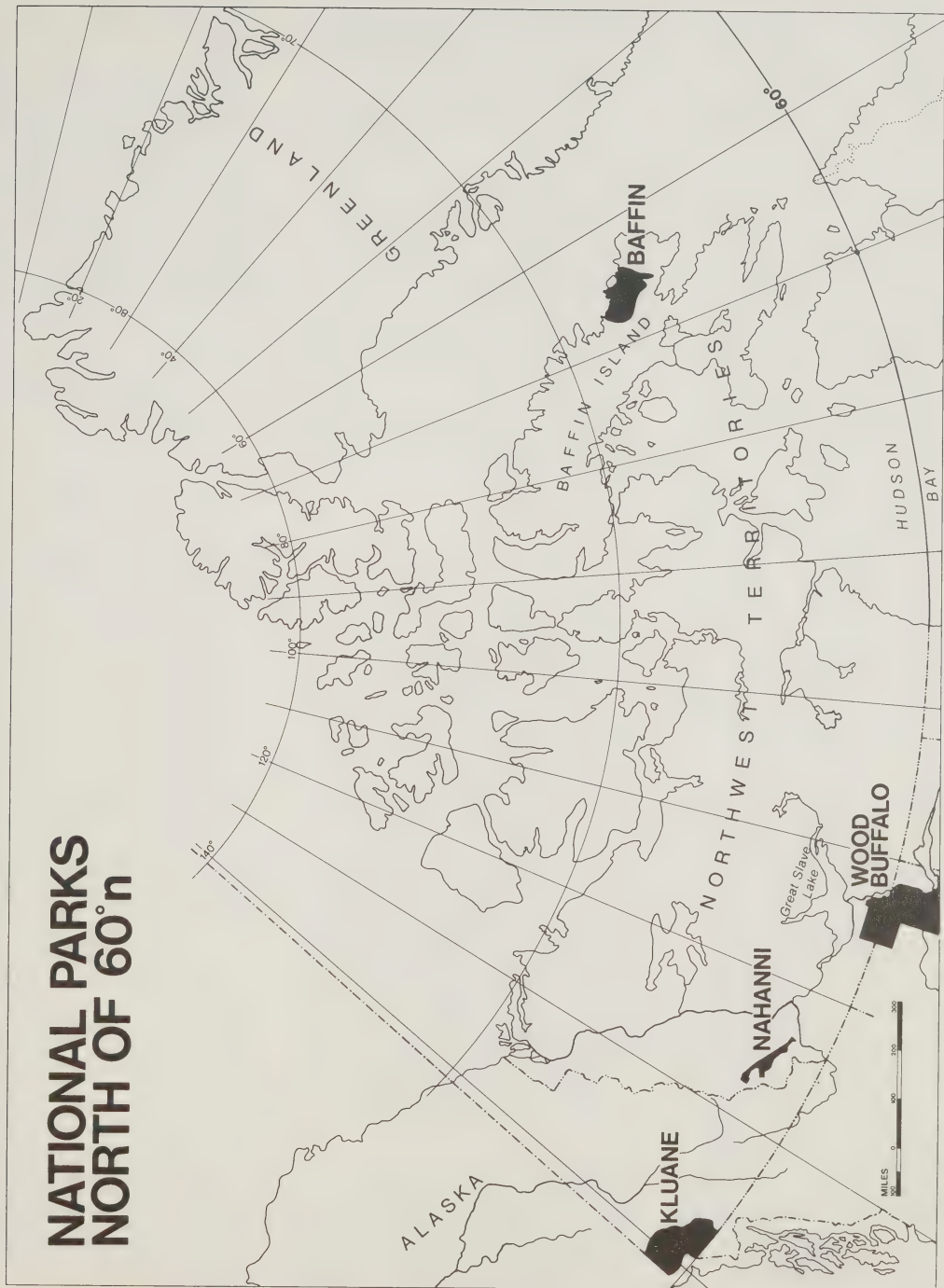
An area of 2,680 square miles around Fort Reliance on the east arm of Great Slave Lake was set aside March 1970 as the nucleus of a future national park. A report by the Canadian Wildlife Service on ecological surveys conducted at the request of Parks Canada was completed in 1972. No additional work or studies were undertaken during 1973-74 pending reception of the views of the Snowdrift band regarding their assessment of the potential impact such a park might have on their way of life.

#### Plans for 1974-75

Parks Canada will lend any assistance required to the band throughout the five year assessment period (April 1970 to April 1975) requested by the Snowdrift band and agreed to by the Minister.

### Proposed Pingo Park, Tuktoyaktuk Peninsula, N.W.T.





### Review of 1973-74 Operations

Pingos, large dome-like structures of ice covered by a mantle of soil and vegetation, are one of the several frost phenomena which characterize northern environments. They are found occasionally in the Russian North, in Greenland and in Alaska, but they are most numerous in and around the Tuktoyaktuk Peninsula where more than 1,400 have been identified.

Following field examinations of the Tuktoyaktuk peninsula, Mackenzie delta and environs by the Canadian Wildlife Service (CWS), the International Biological Program (IBP) and Parks Canada, a proposal was prepared to establish a pingo park in the vicinity of Tuktoyaktuk. Field data were finalized during late summer 1973 and a report supporting a proposal was circulated within the Department for consideration by the various agencies involved.

### Plans for 1974-75

Further action will depend on deliberations currently underway.

### Wood Buffalo National Park

#### Review of 1973-74 Operations

Budget for 1973-74: Capital — \$188,600; operation and maintenance — \$586,000.

In addition, fire fighting expenses of \$465,000 were incurred during the summer of 1973. The Park had 41 forest fires which burned approximately 8,995 acres. As in 1972, favourable weather conditions were experienced and this, together with a well-organized pre-suppression program, resulted in low fire losses and reduced expenditures.

The bison management program continued with increased surveys, necessitated by unusually high winter water levels in the Peace-Athabasca Delta and resulting in herd disruption. A total of 2,887 bison were vaccinated for anthrax at Sweetgrass station. No anthrax outbreaks occurred. Additional corral site assessment was carried out.

Further studies were conducted in the Peace-Athabasca Delta and public hearings were held on the task force recommendations. An analysis of recreation and other values of the Peace point area was carried out. A Master Plan concept was prepared for the park. Further negotiations on Indian land entitlements were pursued.

### Plans for 1974-75

Bison surveys will continue and corral site assessment work will be completed with the final report expected in October 1974. A vaccination program is planned for June and anthrax surveillance will continue.

The resource inventory program will commence in 1974 and a visitor use impact study will be carried out at Pine Lake. Area planning studies will be carried out at two other locations and preliminary planning studies will be done on the Delta and River systems. Work on a park interpretive plan will commence and the park interpretive program will be inaugurated. Interim picnicking and camping facilities will be established around the Loop Road and the Pine Lake facilities will be upgraded.

### Long-term Plans

The principal goal is the preparation of the park Master Plan through public participation and collaboration with the various agencies concerned.

### Nahanni National Park

#### Review of 1973-74 Operations

Budget for 1973-74: Capital — \$63,000; operations and maintenance — \$52,000.

Following the formal reservation of land for national park purposes in 1972, the park completed its first full season of operation. A temporary warden headquarters has been established at Nahanni Butte and one park warden was on site from May to November 1973. Nahanni National Park will continue to be administered by the Wood Buffalo National Park Office for the foreseeable future.

The speleological and geomorphological investigations of the caves continued in 1973 and the preparation of an annotated bibliography and review of literature pertaining to the park and region were initiated. Most field investigations by park staff were oriented towards the identification of potential visitor facility locations.

Approximately 500 persons visited the park and three outfitters licensed by the Government of the Northwest Territories operated in 1973.

### Plans for 1974-75

Enlargement and upgrading of the Nahanni Butte warden complex will be carried out and two park wardens will be permanently stationed there in the Spring of

1974. A VHF communications network will be installed in the park.

The inventory of resources will continue in 1974 with emphasis on an aerial photography and wildlife study. Visitor facility impact studies will be carried out by the Canadian Wildlife Service at Virginia Falls and the Krause Hot Springs. Primitive camping facilities of a temporary nature will be established at four locations pending the completion of the Master Plan. Preliminary Master Plan work by officers of the Prairie Regional Office will commence in 1974. A study of the access corridor to Nahanni Butte and a headquarters feasibility study will be made.

### Long-term Plans

These will involve the preparation of alternative conceptual plans and their review through public participation.

### Kluane National Park

#### Review of 1973-74 Operations

Budget for 1973-74: Capital — \$228,000; operations and maintenance — \$134,000.

Four new field staff, operations manager, park naturalist, maintenance craftsman, and clerk formed an administrative base to operate from the old Department of Agriculture Experimental Farm at Mile 1,019 on the Alaska Highway. Six summer students assisted in the summer operations. An administrative centre with a visitor reception and information area was established at the headquarters. In addition, an area headquarters was located in Destruction Bay, Mile 1,083, Alaska Highway. During 1973, the final phase of the ecological reconnaissance was completed by the Canadian Wildlife Service and the park staff conducted the first of a series of intensive wildlife surveys. Thirteen mountaineering expeditions made their way into the St. Elias Mountains and several hundred visitors registered at the Information Centre. Park planners completed planning guidelines and continued studies towards the development of a provisional master plan. A parallel study was jointly undertaken with the Yukon Territorial Government on the land use requirements associated with anticipated tourist activities. Negotiations with the owners of mining claims located within the park boundaries, were begun in 1973 with the objective of phasing out all such activities on park lands. During fiscal year

73-74 Treasury Board authorized the acquisition of the interests of four claimers having a value just under \$200,000.

#### Plans for 1974-75

As of April 1, 1974, Kluane National Park will become part of the Prairie Region's responsibilities. During 1974, resource management and inventory studies will continue and several studies to assess the impact of possible future development will begin. Eight additional permanent field staff expected in 1974 and a number of seasonal staff will assist during the visitor season. A Conservation Corps program will begin in July allowing sixteen northern youth a first hand opportunity to learn about and participate in park operations. Waste disposal facilities will be developed in co-operation with the local improvement district and four staff houses will be constructed at Haines Junction. Another area headquarters will be established at Tadeash, approximately Mile 116 of the Haines Road. A superintendent will take over operations in 1974, and a resource management planner will fill the former rations manager position. Negotiations to extinguish former mining claims within the park boundaries will continue and a general clean up in areas of previous activity will be completed.

#### in Island National Park

##### Review of 1973-74 Operations

Budget for 1973-74: Capital — \$294,000; operation and maintenance — \$78,000. During its first year of operations, the park received approximately 100 visitors. An operations manager was appointed in April and a temporary administration office and manager's residence were constructed at Pangnirtung. Two Inuit wardens were engaged, one in Pangnirtung and one in Igloolik as well as a clerk-interpreter to assist visitors. A number of Inuit began a cleanup of debris accumulated in the park over the years. Two houses and a workshop were transported in by boat and camped on site. Contracts were awarded for studies of the following nature: a geological study; a socio-economic and archaeological study; a topographic exploration survey and a preliminary climatological study. The Quebec Regional Office completed a preliminary development concept. Emphasis will be placed on maximum conservation

and the basic structures will be erected around the villages of Broughton and Pangnirtung.

A television documentary film was made on the park as part of the "To the Wild Country Series", shown nationally in January and to the Inuit community in March.

#### Plans for 1974-75

It is expected that personnel will be augmented to include a chief warden and two seasonal wardens. Cleanup of debris will be continued, two new buildings constructed and it is anticipated that work on construction of visitor shelters along trails will be commenced.

Resource inventory will continue. It is expected that local impact and regional integration studies will be completed, the geological inventory continued and a bio-physical inventory begun.

#### Long-term Plans

Few major changes related to Baffin Island National Park are foreseen in the future. Studies will be undertaken to analyse development potential of several points of major attraction, without, however, losing sight of the basic objective of "maximum conservation".

#### Byways and Special Places

##### Review of 1973-74 Operations

A joint Federal-Territorial study of the potential of the MacKenzie River as a National Historic Waterway was undertaken.

A one month air and boat survey in August served to assess the quality of landscape, frequency and significance of natural, historic and cultural features, visitor services and facilities and small craft potential of the Mackenzie.

Two reconnaissance reports were completed: "Small Boating on the Mackenzie River" and the "Mackenzie River-Historic Water Route".

#### Plans for 1974-75

The establishment of possible Byways in the North will be discussed with the Northern Affairs Branch and with the Territorial Governments.

#### National Historic Parks and Sites Branch

##### Responsibilities

To commemorate, in consultation with the governments of the Northwest and Yukon Territories, those persons, places and events recognized as being of national historic importance in the Territories.

##### Long-term Plans

To implement, after acceptance by the Minister of Indian and Northern Affairs (and according to established policies), recommendations by the Historic Sites and Monuments Board of Canada, the Minister's advisory body on historic matters.

The Board will continue to study ways and means of commemorating the history of the Arctic with its varied themes of the people, early exploration, fur trade, whaling and others.

The major program to develop the Klondike Gold Rush International Historic Park will be continued, including the joint development by Canada and the United States of the Chilkoot and White Pass Trails from Dyea and Skagway, Alaska to Bennett, British Columbia. The old church at Bennett will be stabilized and preserved.

The various methods of mining gold will be demonstrated along Upper Bonanza Creek. Dredge No. 12, which represents mobile institutional mining, will be dismantled and moved to that site. Dredge No. 4 will be preserved *in situ* as will the Gold Room at Bear Creek. It is planned to erect a Visitor Reception along the Upper Bonanza Creek.

Restoration will be undertaken on a number of the historic buildings acquired at Dawson City, the focal point of the gold rush. This major on-site program will also include the stabilization of other structures.

##### Review of 1973-74 Operations

Dredge No. 4, located about one half mile from Discovery Claim, has been transferred to the Department by the Yukon Consolidated Gold Corporation.

Agreement was reached with the Commissioner of the Yukon Territory regarding a new site on which to relocate the S.S. *Klondike* in Whitehorse. Historical research was continued on the vessel and artifacts and furnishings were acquired.

In Dawson City the Department acquired the Court House; the J.B. Tyrell House, a two-storey log cabin dating from the gold rush; and the Barrow property, which was a



donation. A number of other properties of possible historic interest were appraised. Also the restored and interpreted Robert Service Cabin was opened to the public. External maintenance was carried out on the post office and on the R.C.M.P. jail and Winauts' Store was structurally strengthened. Foundation stabilization was effected on the Commissioner's Residence and Ruby's place and ground maintenance performed on all properties under the Department's ownership.

Agreement in principle was reached with the Province of British Columbia for the transfer of land to Canada to allow for the inclusion of the Chilkoot Trail into the Klondike Gold Rush International Historic Park. The agreement calls for the transfer of 80 square miles of land in a corridor from the American border to Lake Bennett, including the Chilkoot Trail and a small area at the American border in the White Pass. The Province also indicated their willingness to transfer the old church at Bennett to the Department. Facilities were installed at Bennett for the use of hikers over the Trail.

The Klondike Gold Rush International Historic Park Advisory Committee met on two occasions during the year. The Committee, which is composed of two members each from the Canadian and the United States Governments, and one each from Alaska, British Columbia and the Yukon, advise on planning and development for the Chilkoot and White Pass Trails area of the proposed park.

#### *Budget — 1973-74*

	Capital	Operation and Maintenance
Dawson City	\$199,000	\$116,000
Whitehorse	\$185,000	\$ 71,000
Chilkoot Trail	\$ 10,000	—

#### *Plans for 1974-75*

Historical research and restoration will be continued on the S.S. *Klondike* which will be moved to its new site. The barge at Atlin will also be transported to the new site.

In Dawson City, site cleanup and critical stabilization and maintenance will again be undertaken. Historic markers will be installed along the entire length of the Chilkoot Trail from Skagway, Alaska to Bennett, British Columbia in cooperation with the United States Park Service.

## **NORTHERN POLICY AND PROGRAM PLANNING BRANCH**

### *Policy and Planning ACND Division*

#### **Responsibilities**

The recently established Policy and Planning ACND Division is the focal point for carrying out, in co-operation with the members of the ACND, medium and long range socio-economic planning for the North, including the development of policy alternatives for a medium and long range development strategy, regional planning in the North, the review of the effectiveness of current federal policies for the North and the development of the data base and statistical measures needed to support this activity.

#### **Review of 1973-74 Operations**

During 1973-74 much of the Division's work related to completion of studies begun by the Economic Staff Group, whose activities were absorbed into this Division and the Northern Program Planning Division, described elsewhere in this Report. These studies include:

- a report on population projections of the Northwest Territories to 1981, which shows that the population is expected to range from 49,425 to 50,298 persons in 1981 as projected under various sets of assumptions regarding fertility, mortality and migration rates.

- a Northwest Territories statistical abstract containing available statistics with their sources on population, manpower, education, health, welfare and social security, housing, incomes, mineral resources, tourism, forestry, hunting and trapping, fisheries, manufacturing, electric power, retail and service trades, prices, government revenues and expenditures and transportation.

- the development of an information system for ascertaining on a continuous basis the status of the labour force in communities in the Mackenzie Valley and the training capability related to pipeline and highway employment.

- employment estimates for the Yukon and Northwest Territories for 1967, 1968 and 1970.

- reports on income and income distribution in the Arctic Coast Region, Baffin Region and Keewatin District of Northwest Canada which show, among other things, that current personal income in these areas doubled between 1964 and 1969 and that average and median annual family income for the Inuit population are lower than those for Canada as a whole. These reports are part of a series which includes a report on the Mackenzie District.

### *Northern Program Planning Division*

#### **Responsibilities**

The Northern Program Planning Division is one of two divisions which were formed from the former Economic Staff Group following the reorganization of the Northern Affairs Program in 1973. The Division is responsible for planning and developing departmental programs designed to encourage economic development in the North in accordance with departmental objectives and policies.

#### **Review of 1973-74 Operations**

The following projects were carried out or directed by the Division during 1973-74:

- Studies relating to the socio-economic impact of the construction and operation of a gas pipeline in the Yukon and Northwest Territories
- In collaboration with the Ministry of Transport, studies relating to the development of a rail strategy for the Yukon and to marine resupply of Keewatin and Arctic communities

A study of the socio-economic impact of the Pointed Mountain Gas pipeline on residents in the Fort Liard area

An assessment of the benefits and costs of using gas, electricity or oil as a source of energy in Mackenzie Valley communities

A detailed evaluation of a proposal to develop a zinc-lead mining operation at Strathcona Sound, N.W.T.

Preliminary assessments of possible mining developments on Baffin Island and Little Cornwallis Island

A review of existing incentive programs designed to encourage northern development and development of proposals for improvements to these programs

Studies relating to changes in the Income Tax Act pertaining to mining developments and the impact of these changes on the tax structure in the North

Continuation of work commenced in 1972 on the development of a system of social accounts for the North as well as the preparation of a report on social indicators

#### Plans for 1974-75

Projects to be undertaken by or on behalf of the Division in 1974-75 are as follows:

Studies relating to the socio-economic impact on northern residents of a gas pipeline from the Arctic Islands to southern Canada

Continuing studies in co-operation with the Ministry of Transport on developing a strategy for rail developments in the Yukon

Detailed evaluations of possible mining developments in the Arctic Islands and in the Yukon

In collaboration with the N.W.T. government, a study of pipeline property taxation alternatives for the N.W.T.

Development of incentive programs to encourage northern development in accordance with northern objectives

Background studies and recommendations for the development of a taxation policy for the North

#### Long-term Plans

To assist in the development of the Indian North by:

Developing incentive programs to encourage the economic development of the

North in accordance with the objectives that have been approved by Cabinet

- providing economic advice on matters relating to resources, transportation and general economic development in the North.

#### *Northern Roads and Airstrips Division*

The major task of this Division during the year was the administration of the Northern Roads Program approved by Cabinet in 1965. This program calls for an expenditure of \$10 million a year for a ten-year period to construct a network of roads that would reconnect centres of population and provide access to areas of resource potential. Its secondary function was to administer the Northern Mineral Exploration Assistance Program and the incentive programs related to access road and airstrips construction assistance.

The Dempster and the Mackenzie Highways continued to be identified as the major construction projects during 1973.

#### **Dempster Highway**

From Mile 0 of the highway, just south of Dawson, Y.T., the system stretches 417 miles to a point where it joins the Mackenzie Highway some 33 miles south of Inuvik. When completed this all weather road network between the Mackenzie River Delta communities and Dawson in the Yukon will be the first all weather direct link between the Yukon and the N.W.T. as well as providing a low cost alternative to seasonal barge traffic.

During 1973, Herschel Construction of Whitehorse completed the section Mile 166-178 at a cost of \$5,738,254 while Watsko Construction completed the section from Mile 377 (Arctic Red River) to 342 (Fort McPherson at a total cost of \$7,479,161.). At the end of December 1973, 210 miles of the Dempster system had been completed, therefore, leaving approximately 207 miles for completion.

In 1973-74 a contract was awarded to Wiley Oilfields Hauling Ltd./Norm Keglovic Construction Ltd. joint venture, for construction of section Mile 178-237. This section of the highway estimated to cost \$7,100,000 is scheduled for completion in 1974-75.

Arrangements have also been completed with the Department of National Defence for the construction of the Eagle River Bridge at Mile 236, of the Dempster in the Yukon. This project is scheduled to begin in

1974 with completion in 1976 at a total estimated cost of \$975,000. During 1974, a contract will be awarded for construction of the section from Mile 290 to 342. (Fort McPherson). The estimated cost of this section is \$10,305,000.

#### **Cost Sharing Roads**

Provision is made in the Northern Roads Program for cost-shared roads required for exploration or development purposes. Assistance is available for the construction of low standard (tote trails), medium-standard (initial access roads), and higher-standard roads (permanent access) to approved resource development projects. Financial assistance in the amount of \$111,750 for access road construction was disbursed in 1973.

#### **Northern Airports**

The Northern Resource Airports Program assists, on a cost shared basis, the construction of access airports in exploration and development projects. The scale of assistance is related to the various types of operation the airport is designed to serve. During 1973, four applications were received of which one was for oil and gas and three for mineral exploration and a total of \$61,060 was paid in grants.

The Remote Airports Program provides for the construction of airports at isolated settlements, not served by scheduled airline, to facilitate uninterrupted medical, educational and judicial services.

To date, three airports have been constructed in the N.W.T., one at Coppermine, and one at Pangnirtung and one at Whale Cove while in the Yukon one was built at Old Crow. Six additional airports will be built during the initial phase of the program.

#### **Northern Mineral Exploration Assistance**

To encourage the direction of capital to northern ventures, the Government introduced the Northern Mineral Exploration Assistance Program under which 40 per cent of all exploration costs of mineral, oil and gas may be recovered, and are repayable only if, as a result of the discovery, production ensues. Since the inception of the program in 1967, 190 applications have been approved and a total of \$3,814,210 has been paid in grants, leaving an outstanding commitment of \$688,559.

#### **Plans for 1974-75**

During 1974-75 heavy emphasis will be placed on planning for the development road

access to the Mackenzie Delta Region both from the south along the Mackenzie Valley in the N.W.T. and from the west via the Dempster Highway in the Yukon.

This priority program would prove most timely to aid pipeline construction in north-western Canada. It will also speed up the economic activities and development of other natural resources, thus improving opportunities for the productive employment of native northerners, one of the main social objectives of the Northern Roads Program.

#### **Mackenzie Highway 1973-1974**

In May 1972, the Prime Minister announced an accelerated construction program for completion of the Mackenzie Highway from Fort Simpson to Inuvik.

This highway will stretch from the Alberta-N.W.T. border 969 miles to Inuvik continuing possibly on to Tuktoyaktuk on the Arctic Coast a total of 1,049 miles. The highway is completed to Fort Simpson (Mile 296), therefore leaving approximately 660 miles to Inuvik for completion. Currently there is only one company, PanCana Industries involved in the building of the highway Miles 297-343, the area between Fort Simpson and Camsell Bend. PanCana began subgrade construction in the fall of 1972 and is expected to complete this section in the fall of 1974. Another contract was awarded to the Catre Construction Company in 1972 for construction of the Mackenzie Highway Miles 931-964, the area between the junction of the Dempster Highway and Inuvik. This section was completed and turned over to the N.W.T. Government for maintenance in September, 1973.

In an effort to implement policy stating that native northerners should be given opportunities above and beyond those accruing from traditional training program (ie. heavy equipment operators) the Mackenzie Highway Project, in co-operation with the Indian Program of this Department and the Government of the N.W.T. was instrumental in the successful establishment of Dene Mat Construction Ltd. in December 1973.

The Dene Co-operative of Fort Simpson combined in partnership with an Alberta contractor to form the new company. Its objective is two-fold: to establish itself as a viable business and to provide native northerners with entrepreneurial experience in

order that they may be successful competitors in highway construction and maintenance contracts. The company's first contract, a \$250,000 gravel stockpiling contract for the Mackenzie Highway was successfully completed in February 1974. Dene Mat won a Ministry of Transport contract in open competition in December 1973 for stockpiling of 50,000 tons of gravel at the Fort Simpson airport. This contract was very successfully completed March 1974.

In April, 1973, a training program for heavy equipment operators was established by this Department. The plan was to train northern natives as heavy equipment operators, capable of working on highway jobs on the Mackenzie Highway. In order to accomplish this goal, an eleven-mile section, Mile 399-410.9, was set aside as a training section. To date, the section's right-of-way has been cleared and eight miles of the subgrade have been completed with the remainder being completed by the Summer of 1974.

As of March, 1974, the number of men trained or partially trained as heavy equipment operators is as follows:

Number of men full trained	21
Number of men partially trained	11
Number of men still training	6
Total	38

#### **Plans for 1974-1975**

According to our current plan, no new construction has been scheduled. The 1974-75 program will not include the awarding of any major construction contracts before spring 1975. Pre-engineering and design for the Mackenzie Highway up to Inuvik is scheduled for completion by the fall of 1975.

Plans are being made to extend the training section in order that the program for training native residents as heavy equipment operators can be continued. In addition, a 20 to 30-mile operational section of the highway is to be set aside for Hire North to construct. This will provide an opportunity for graduate trainees to maintain the level of proficiency they previously acquired on the training section.



## TERRITORIAL AND SOCIAL DEVELOPMENT BRANCH

### *Territorial Division*

#### **Responsibilities**

To act for the Federal Government in the negotiation and administration of federal-territorial financial agreements with both Territories.

To review fiscal and legislative policies and development plans for both the Yukon and Northwest Territories and to advise the deputy minister on matters relating to the administration of the Territories.

To co-ordinate the work of the Department of Indian Affairs and Northern Development and the governments of the Yukon Territory and the Northwest Territories in all federal matters not related to natural resources.

To advise the commissioners of the Yukon and the Northwest Territories on matters of government administration in the two Territories.

To co-ordinate the transfer of provincial-type services under the jurisdiction of the Federal Government to the governments of the Yukon Territory and the Northwest Territories.

To co-ordinate arrangements between the Territorial governments and other departments and agencies of the Federal Government on matters affecting areas of Territorial government responsibility.

#### **Long-term Plans**

To develop long-term federal-territorial policies and financial agreements with both the Yukon Territory and the Northwest Territories and to assist the governments of the two Territories in the exercise of their responsibilities and in the development of a more responsible form of government.

To support proposals on Territorial fiscal and legislative policy before federal co-ordinating and control authorities.

provide both Territories with enlarged Councils and with a larger measure of control over their internal operations. A second Bill would, for the first time, provide representation in the Senate from both Territories. The Division arranged financial assistance to the Freshwater Fish Marketing Corporation which enabled the construction of a new fish processing plant at Hay River. The new plant opened in the spring of 1973. The Division co-ordinated financial arrangements for three major projects during the year; work began on a new, integrated community at Resolute Bay, and on a complex at Rankin Inlet which is to replace the Territorial government's Regional Office

at Churchill. Work began also on replacement of the Robert Campbell Bridge which suffered severe structural damage during the break-up of the Yukon River in the spring of 1973, and on a new Territorial administration building in Whitehorse. The Northwest Territories Housing Corporation began operations on January 1, 1974. The Corporation will assume responsibility on April 1, 1974 for the operation and direction of the Northern Rental Housing Program.

Financial assistance for the governments of the Yukon Territory and the Northwest Territories was appropriated in 1973-74 in the following amounts:

#### *a) Financial Agreements*

	<i>Yukon</i>	<i>Northwest Territories</i>
Operating Grant	\$6,864,000	\$56,025,000
Grant-in-lieu of income taxes	4,637,000	6,471,000
Capital loans	5,600,000	15,600,000
Amortization grant	3,583,000	7,276,000

#### *b) Additional Financial Assistance outside the Agreements*

##### *1) Yukon Territory*

Contribution — Hospital care of Indians and Eskimos	\$ 173,000
Contribution — Medicare for Indians	120,000
Contribution — Low income Rental — Purchase Housing	196,000
Contribution — Completion of 1972-73 Federal Labour Intensive Projects	215,000
Second mortgage loans to residents (CMHC)	120,000
Loans to third parties	

##### *2) Northwest Territories*

Contribution — Hospital care of Indians and Eskimos	1,352,000
Contribution — Medicare for Indians and Eskimos	213,000
Contribution — 1st-mortgage low-cost housing subsidies	25,000
Territorial rental housing plan	870,000
Contribution — Toward Eskimo acquisition of boats	15,000
Contribution — Frobisher Bay Arena assistance	300,000
Contribution — Completion of 1972-73 Federal Labour Intensive Projects	238,700
Loans to third parties	2,555,000

The Division co-ordinated the negotiations for Federal-Territorial financial agreements to begin April 1, 1974, for both Territories.

#### **Plans for 1974-75**

The administration, co-ordination and supervision of one-year financial agreement which begins April 1, 1974 for both Territories to be carried out under the following terms:

#### **Review of 1973-74 Operations**

The Division co-ordinated work which in March, 1974, to the tabling in Parliament of a Bill to amend the Northwest Territories Act and the Yukon Act to

	<i>Yukon</i>	<i>Northwest Territories</i>
Operating Grant	\$ 5,187,000	\$60,205,000
Grant-in-lieu of income taxes	5,446,000	8,351,000
Amortization grant	4,166,000	9,234,000
Capital loans	11,603,000	32,331,000
Loans for relending to third parties	2,100,000	4,100,000

Research is continuing into possible new procedures for the provision of federal financial assistance to the Territorial governments.

### *Social Research Division*

#### **Responsibilities**

To sponsor and conduct research into human problems of northern development; to encourage and support such research by non-government agencies; to collect and disseminate scientific information, and to operate the Inuvik and Igloolik Research Laboratories.

#### **Long-term Plans**

To assist in the development of the Canadian North by encouraging scientific investigation; to provide advice and research services to organizations within the Department; to co-ordinate the collection of information on Arctic developments outside Canada; to formulate detailed research plans and to arrange their implementation; to interpret and assess relevant research done by other agencies.

#### **Review of 1973-74 Operations**

Northern research continued in 1973-74 with an emphasis on work related to problems of social change for native people in the North (and, in particular, on the possible effect of pipeline construction). A considerable portion of research during 1973-74 was done by university scientists working under contract or in seasonal employment.

Research projects carried out by or directed by the group

- Problems of modernization for native people in the North.
- Greenland Film Production — production of a community development film for northern people — joint project with the National Film Board.
- History text on northern Indians and Eskimos of arctic Canada.
- Social deviance at Frobisher Bay.
- Ethnic relations in the North.
- Implications of pipeline development for community organizations.
- Social impact on Old Crow, Y.T. of the Porcupine route versus coastal route for a pipeline.

- Social-psychological study of the effects of induced change on native peoples.
- A broad study into the employment — related preferences and aspirations of Yukon natives.
- Settlement bibliography of scientific literature on settlements in the Yukon and N.W.T.
- Arctic sanitary engineering bibliography

#### **Grants Program for Northern Research Institutes and Scientific Research Expeditions.**

In 1973-74 the twelfth year of this program of assistance to institutes and expeditions, amounts totalling \$350,000 were awarded, as recommended to the Minister by a grants committee. Through these grants, a large number of northern research projects were supported in a wide variety of scientific disciplines. Grants were made to:

- Arctic Institute of North America
- Arctic Studies Group (Université de Montréal)
- Boreal Institute (University of Alberta)
- Centre d'études nordiques (Université Laval)
- Committee on Northern Studies (University of Manitoba)
- Committee on Arctic and Alpine Research (University of British Columbia)
- Institute for Northern Studies (University of Saskatchewan)
- Committee for Arctic & Sub-Arctic Research (University of Toronto)
- Arctic Studies Conference (McGill University)
- Institute of Social and Economic Research (Memorial University).
- McGill Committee for Northern Research (McGill University)
- The Devon Island Expedition (Arctic Institute of North America)
- The Icefield Ranges Research Project (Arctic Institute of North America)
- Northern Research Group (University of Ottawa)
- Northern Research Committee (University of Western Ontario)
- Centre de recherche nordique (Université du Québec à Chicoutimi)
- Presidential Committee on Northern Studies (McMaster University)
- Committee on Northern Research (Bishop's University)

#### **Grants for Applied Research, Meeting Specific Requirements of this Department.**

These grants were initiated in 1969-70. Their purpose is to support research in problem areas specified by the Department of Indian Affairs and Northern Development. \$100,000 was allotted in 1973-74.

A grant of \$30,000 has also been made to the Arctic Institute of North America for the publication of the Arctic bibliography. Research supported by the applied grants program continues into the following year.

#### **The Scientific Research Laboratory, Inuvik Northwest Territories**

This laboratory, opened in 1963, provides general laboratory and other facilities to support a variety of scientific disciplines. The laboratory includes a cosmic-ray measurement annex, low-temperature rooms, photographic dark room, library, seminar room, offices and general or special laboratories. The laboratory lent support to approximately 375 investigators and 310 scientific projects, and provided 4,000 accommodation-bed nights. Several abandoned DEW line stations have been renovated for use as scientific research units.

#### **Plans for 1974-75**

To continue to develop programs of research directed toward the human problems of northern development, and in particular to place an emphasis on assessment of the potential social impact of pipeline and highway construction in the North. Increasing scientific interest in the North, stemming from the growing emphasis on economic development has created a need for laboratory facilities in the eastern Arctic to parallel those now provided at Inuvik, western Arctic. The construction of a research laboratory facility for Igloolik in the Foxe Basin area was started. It is located on the coast in an area of geographical, climatic and topographical diversity, and in a region where renewable resources are exceptionally rich. Completion of construction will be in 1974-75 and will provide much-needed facilities for scientists, for government, universities and industry.

### *Social Development Division*

#### **Responsibilities**

The Social Development Division, formerly called the Northern Services Division, coordinates the administration of



special programs for Inuit and other northern residents, either on behalf of the Government of the Northwest Territories or representing residual federal responsibilities.

During 1973, the Division was reorganized into the following sections: the Special Services Section, the Culture and Linguistics Section, the Eskimo Art Section, the Native Liaison Section, the Education Section and the Employment Liaison Section.

The Special Services Section provides specialist advice on various matters relating to Inuit and northern native people generally. It is also responsible for the Eskimo Loan Fund, the Eskimo Small Boats Assistance Scheme and the Canadian Reindeer Project.

The Culture and Linguistics Section provides a translation service in various dialects of the Inuit language, and publishes the national Inuit magazine entitled "Inuttituu". It also administers a grants scheme for the preservation and furtherance of the Inuit culture. This section also sponsors Inuit language films and assists in the publication of Inuit literature.

The Eskimo Art Section promotes Inuit art by lending the Department's collection of Eskimo arts and crafts to museums, universities and other institutions in Canada and abroad. It also provides specialist advice and assistance to the public on matters relating to Inuit art. This information service tends to include public lectures and school visits by the staff. Assistance is provided to Canadian Arctic Producers Limited, the central marketing agency for northern arts and crafts in the development of new products, and to the Canadian Eskimo Arts Council in the implementation of its recommendations.

The Native Liaison Section is responsible for establishing and maintaining liaison with northern native associations in matters related to northern development and other issues of concern to northern native people. The section supplies funds and otherwise facilitates the process of consultation with northern native peoples — a major requirement of the Cabinet Policy Statement on Northern Development.

The Education Section is responsible for providing a counselling service for northern students in southern Canada, arranging training and education programs as well as support services in southern Canada as required. The section is also responsible for arranging relocation to employment in southern Canada on request. A training-on-the-job program for native northerners is administered by the section. The section is

also responsible for the operation of the Duke of Edinburgh School at Fort Churchill, Manitoba.

The Employment Liaison Section provides contact with all potential employers in the North, including resource development industries, federal departments and agencies, territorial governments and trade unions to ensure that the native northern residents have every opportunity to share in, and benefit from, the development of the North. The work covers the development of special employment programs, the negotiating of specific agreements and their subsequent monitoring and the encouragement of employment opportunities for native northerners.

### Review of 1973-74 Operations

During the year plans were completed for the sale of the government reindeer herd in the Mackenzie Delta to a private company comprised of Inuit shareholders. A capability in the Labrador dialect was added to the Inuit translation service, and the magazine "Inuttituu" moved to colour production as well as to more items of topical interest. Cultural grants were made to a number of Inuit artists for travel to Greenland to attend a meeting of craftsmen. The Canadian Eskimo Arts Council received a new charter which provides for greater Inuit representation. Funds were provided to enable a major conference on Eskimo art which was held in Ottawa in May 1973 with delegates from all Canadian Arctic art-producing communities and observers from Greenland and Alaska. This conference coincided with the opening of the final showing of the internationally acclaimed "Masterworks of the Canadian Arctic", an exhibition organized by the Canadian Eskimo Arts Council. The Department also provided funds to Inuit Tapirisat of Canada to hold a planning conference on Inuit orthography and Inuit language. The planning conference recommended the establishment of an Orthography Commission to study all Inuit forms of writing and the possibility of standardizing these forms. The Department provided assistance to enable the first dictionaries to be published in the Labrador dialect from Inuit to English and English to Inuit. Assistance was provided to Inuit Tapirisat of Canada for a Land Claims Research Project and a Land Use and Occupancy Study.

An on-the-job training program was initiated providing employment for 50

northern natives. Over 175 native northerners were assisted in educational institutions in the south. The Churchill Vocational Centre was phased out in June 1973 and the program was transferred to the Gordon Robertson Educational Centre at Frobisher Bay. Over 35 Inuit were assisted to relocate from the Keewatin Region to permanent employment at Lynn Lake, Manitoba. Special employment clauses were prepared for all new contracts for highway construction in the North and arrangements were completed with Canada Manpower for native northerners to be referred first for all positions with the highway contractors. The monitoring of existing agreements continued, while new agreements were developed. During the 1973 exploration season, 827 native people accepted employment in the petroleum industry.

### Plans for 1974-75

The Division's translation services capability will be expanded to include all major Canadian Inuit dialects, the magazine "Inuttituu" will also carry articles in all dialects. The first Inuit film unit will be developed in cooperation with the National Film Board. A workshop for Arctic Crafts-women will be held in Toronto in June 1974 in conjunction with the exhibition/competition "Crafts from Arctic Canada". A national collection of Inuit art will be established in cooperation with the National Museum of Man. The Division will also continue to expand and improve its liaison with northern native associations. Contributions to assist the process of consultation with northern native peoples in matters of northern development will be made to northern native associations. The Division will participate in the funding of the Indian Brotherhood of the Northwest Territories "Land Claims Research Project". It is planned to transfer operational responsibility for the Duke of Edinburgh School at Fort Churchill to the Town of Churchill School Board on July 1, 1974. Greater emphasis will be placed on the "on-the-job training program" to place more trainees in the North and in particular within the federal public service. The negotiation of Training and Employment Agreements will continue with industries establishing in the North, with special emphasis on mining and petroleum companies, to ensure maximum participation of native people in the development of the North. A new program will be started to promote the greater employment



of native northerners in the federal public service in the North.

**Long-term Plans**

The Social Development Division will continue to provide specialist advice on various matters relating to Inuit and the North in general. Emphasis on Inuit cultural development will be maintained and plans will be completed to transfer Canadian Arctic Producers Limited to native control and ownership. The Division will strive to ensure the implementation of the policy of the Government of Canada, Northern Canada in the 70's, with particular emphasis on creating employment opportunities for native people. It will also maintain its liaison and consultation role with northern native organizations and review claims submissions and other documents sent to the Government by providing a northern expertise.

## DEPARTMENT OF JUSTICE (JUST)

### Responsibilities

Appointment of judges to the Territorial Supreme Courts and the direction of Court proceedings on behalf of the Crown include prosecutions under the Criminal Code and other federal statutes. The Department has also a shared responsibility for the cost of legal aid in the Northwest Territories.

### Review of 1973-74 Operations

Payments totalling \$37,500 were made to the Northwest Territories representing the federal share of the cost of legal aid for the year ending March 31, 1973. The terms of the legal aid agreement between the Northwest Territories and the Federal Government were reviewed in the light of experience and an agreement was reached on some minor amendments to be effected.

Discussions continued concerning the establishment of a shared-cost legal aid program in the Yukon Territory and of programs in both territories to provide compensation to victims of crime.

### Plans for 1974-75

It is hoped that discussions now taking place will result in the establishment of the shared-cost programs referred to above. It is planned to hold discussions regarding the establishment of a community legal services project in Frobisher Bay.

## DEPARTMENT OF MANPOWER AND IMMIGRATION (M & I)

### Responsibilities

The fundamental purpose of the Department is to further the economic and social development of Canada by helping to meet the employment needs of both employers and workers in every part of Canada. The Department endeavours to achieve this purpose through the application of wide-ranging programs and services, which include a network of strategically located Canada Manpower Centres, professional counselling, recruitment services, training programs, relocation assistance, control of non-immigrant workers, industrial adjustment assistance and programs for people with special needs.

### Review of 1973-74 Operations

The communities of Whitehorse, Yellowknife, Inuvik, Frobisher Bay and Fort Simpson are serviced by Canada Manpower Centres on a full-time basis. The office at Frobisher Bay was established as a new point of service in September of 1973. In addition, there is a sub-office at Hay River. Itinerant manpower service was provided to all other larger settlements in the North, with the frequency of visits depending on the need for services.

Over 14,600 worker clients registered with Canada Manpower in 1973-74. Of the 12,334 persons referred to known job vacancies, 6,765 were placed in employment.

A manpower counsellor was assigned to coordinate the hiring activity for the Dempster Highway.

Workers were assisted under the Canada Manpower Mobility Program to explore or relocate to jobs away from their place of residence. Mobility assistance was also paid to sponsored trainees who were required to travel to training centres.

### Training

During the last fiscal year, 493 training spaces were purchased under the Canada Manpower Training Program in 46 training courses for the residents of the Yukon Territory. Of the 546 adult students who enrolled (including replacements for drop-outs), 199 graduated, 133 dropped out, 21 failed and 193 remained on course at March 31, 1974.

In the Northwest Territories, the Department purchased a total of 938 training spaces during the 1973-74 year, including 475 places in various occupational training courses, 288 persons were enrolled in Basic Training for Skill Development. The apprenticeship program had 61 participants, and industry-based training involved 174 workers.

### Special Programs

During the year, special programs counsellors were assigned to the Canada Manpower Centres at Whitehorse and Yellowknife. They assist in the counselling of clients with special needs and coordinate and develop projects designed to meet the needs of individuals and communities for employment and services. In the Northwest Territories, the Department was involved in one project under the Outreach Program, two projects under the Local Employment Assistance Program and 27 projects under the Local Initiatives Program.

### Operational Jurisdictions

The operational responsibilities for the delivery of the Department's services in the Canadian North are assigned as follows:

#### Yukon Territory

The Director General  
Pacific Region  
Department of Manpower and  
Immigration

Royal Centre, P.O. Box 11145  
1055 West Georgia Street  
Vancouver, British Columbia  
V6E 2P8

#### Northwest Territories

The Director General  
Prairie Region  
Department of Manpower and  
Immigration  
1200 Portage Avenue  
Winnipeg, Manitoba  
R3G 0T5

#### Northern Quebec

The Director General  
Quebec Region  
Department of Manpower and  
Immigration  
550 Sherbrooke Street West  
Montreal, Quebec  
H3A 1B9

### Plans for 1974/75

#### Yukon Territory

A major focus of the Department will be to extend its services to all parts of the Yukon through:

- (1) establishment of regular itinerant service points;
- (2) effective use of the Job Information Centre concept;
- (3) increased application of the Canada Manpower Industrial Training Program;
- (4) more effective "Service to Youth" programs;
- (5) expanded Outreach Program.

#### Northwest Territories

Consideration is being given to increase the level of service in the Northwest Territories by:

- (1) installing Job Information Centres at Yellowknife, Inuvik and Frobisher Bay



- 2) establishing branch offices at Hay River, Fort Smith and Norman Wells;
- 3) upgrading the Frobisher Bay branch office to an autonomous Canada Manpower Centre;
- 4) placing a Manpower Counsellor at the Vocational Training Centre in Fort Smith.

#### Long-term Plans

The Department is committed to a Manpower Program for the North which takes into account the unique characteristics of the Northern situation. Within this policy is planned that:

- 1) an inventory of the manpower resources of the Northern labour force be established and maintained;
- 2) the delivery of Manpower services be made increasingly responsive to the particular demands of northern development;
- 3) programs be applied which are specifically tailored to the special needs of the Northern worker;
- 4) in remote locations the Department be represented by indigenous personnel; and
- 5) an information program be undertaken which will make known the Federal Government's policy and plans for northern development; in particular, the dynamic employment service to be provided by the Department.

## DEPARTMENT OF NATIONAL DEFENCE (DND)

### CANADIAN ARMED FORCES

#### Objectives

The objectives of the Canadian Armed Forces are:

- to support national policies by contributing to the protection of Canada's sovereignty;
- to work for world peace and security in co-operation with our allies;
- to operate rescue co-ordination centres, and to provide aircraft search and rescue services;
- to assist other government departments and civilian agencies in national support and development, and during civil emergencies.

#### Policy and Plans

To meet these objectives as they apply to Canada's North the Department of National Defence continues its policy of equipping its forces with materiel suitable for Arctic conditions and then training and using these forces in actual northern operations. Several types of activities are carried out each year:

- regular surveillance of northern land, sea and air.
- northern deployments and exercises for land force units including airborne components.
- training cruises to northern waters for ships and submarines of Maritime Command.
- air transport and search and rescue missions in the North.
- assistance in northern engineering projects such as the building and improvement of northern airstrips.

In addition, the department recruits northern residents for the Armed Forces and provides specialized education and training

programs, which are reviewed on a continuing basis, and introduces additional ones where necessary. Northern Region Headquarters at Yellowknife plays an important role in co-ordinating northern operations and collects information on northern requirements which Canadian Forces might fulfil.

#### Review of 1973-74 Operations

##### Maritime Forces

As in previous years, maritime forces maintained a significant presence in the Canadian Arctic. Activities included sovereignty protection and surveillance flights, the deployment of ships in arctic waters, search and rescue flights, training exercises, and flights in support of other government agencies. A permanent detachment has been established at Frobisher Bay to support increasing Maritime Command activity above 60° north.

Argus aircraft operating from bases at Frobisher Bay, Edmonton, Yellowknife, Goose Bay, Inuvik and Thule, Greenland, maintained a minimum schedule of three 45-hour patrols a month, and flew approximately 1,700 hours. Tracker aircraft, reduced in numbers and role, flew approximately 300 hours from bases at Goose Bay and Frobisher. Although the primary purpose of Argus and Tracker flights was sovereignty protection and surveillance, many were flown in support of other government agencies. During the ice-season all northern patrols carried MOT ice observers and conducted ice reconnaissance as a secondary task. Patrols were also assigned photographic tasks on behalf of DIAND, DOE and EMR, particularly the investigation of off-shore oil exploration and drilling activity on the archipelago. Transportation was often afforded to scientists and observers

from other government departments who were conducting such activities as investigation of seabird populations in the Beaufort Sea, and ice research along arctic shores. Maritime Forces also conducted extensive remote sensing trials in the Arctic.

In August, 1973 HMCS *Protecteur* sailed to Arctic waters for six weeks to conduct exercise "Norply 73". Argus, Trackers and Sea King helicopters operated in concert with *Protecteur* throughout the exercise. Northern deployments are tasked to conduct surveillance, scientific and communications trials, to assist in the replenishment of remote settlements, and to conduct special projects. Visits were made to Resolute Bay, Rae Point, Dundas Harbour, Grise Fiord, Pond Inlet, Cape Christian, Broughton Island, Cape Dyer, Payne Bay, Pangnirtung, Port Burwell and Frobisher Bay. In addition to scientists from DREO, DREA and CRC, a scientific team from Acadia University accompanied HMCS *Protecteur*.

##### Land Forces

The series of sub-unit exercises called "New Viking" continued through the year. These exercises are designed to prepare ground forces for surviving and fighting in arctic conditions, summer and winter. The exercises provided an almost continuous military presence in the North, and by the end of 1973, had familiarized more than 5,400 officers and men with the geography, terrain, climate and operating difficulties of the Canadian Arctic. Two "senior officers' serials held each year ensure that staff officers and senior civilian officials are personally aware of the problems of operating in the North.

Headquarters and main support base for exercise "New Viking" are at Churchill. Advanced bases during the winter are established at Baker Lake, Coral Harbour, Rankin Inlet, Frobisher Bay and Yellowknife. In the summer, they are transferred to Sachs Harbour, Mould Bay, Isachsen, Rae Point, Repulse and Resolute.

Exercise "Rapier Thrust", a large scale, Combat Group exercise, was conducted in winter conditions in the Fort Churchill area in January 1974. Units from Victoria, British Columbia; Calgary, Alberta; and Winnipeg, Manitoba participated.

A field survey party from the Canadian Forces Mapping and Charting Establishment provided control for 118 sheets of 1:50,000 scale mapping covering the following:

District of Franklin; parts of Cornwallis and Thurston Islands; District of Keewatin; areas surrounding Shepherd Bay, Spence Bay and Frobisher Bay. The field party consisted of twelve military surveyors supported by two CH135 helicopters from 540 Squadron and one CH135 helicopter from 408 Squadron.

The Canadian Rangers continued to be available on a limited basis for coastal surveillance, providing information, and assisting in search and rescue missions. No emphasis has been placed on recruiting Rangers during 1973. The continuing role of the Canadian Rangers is now under active review as part of the Land Forces Policy Review.

Work on the northern airfield construction program continued this year at Whale Cove, Cape Dorset and Pond Inlet. This program, which began in 1969, is jointly funded by DIAND and DND. 1 Construction Engineering Unit in Winnipeg provided the Arctic Airfield Operations Centre responsible for technical and logistic support and personnel administration. Weekly airlift support was provided by Air Transport Command Buffalo flights after heavy loads were prepositioned at Churchill and Frobisher Bay by CC130 Hercules. 1 Airfield Squadron from Edmonton after a winter and a half seasons of long hours, commenced construction of a gravel strip 100' x 300' at Whale Cove. 3 Field Squadron from Chilliwack carried on with grading and blasting at Cape Dorset, and after two years operation have completed about 90 per cent of the task. The Pond Inlet airfield started this year by 2 Field Squadron from Edmonton. The gravel strip at Pond Inlet is about 20 per cent completed.

Planning continued for the construction of a 300 foot-long single span bridge over

the Eagle River at Mile 237 of the Dempster Highway in the Yukon. This joint DIAND/DPW/DND project to be constructed by military engineers is scheduled for completion by the winter of 1975-76.

### Air Forces

Air Transport Command activity in the North was essentially the same as during 1972. Hercules aircraft provided weekly air service and special flights to the Canadian Forces communications stations at Alert, Inuvik and the Northern Region Headquarters at Yellowknife.

During the annual Bortop airlifts Hercules aircraft of Air Transport Command transported a total of 206 loads of fuel oil and general cargo from Thule to Alert.

The 440 Squadron Twin Otter detachment at Northern Region Headquarters, Yellowknife continued to provide a service necessary for Canadian Forces communications in the North. The two aircraft again provided a valuable addition to the Canadian Forces northern search and rescue capability.

The Search and Rescue organization successfully conducted five major searches for missing aircraft above 60°N, for a total of 536 hours of flying time.

CF5 tactical fighter aircraft of 433e Escadrille tactique de combat, Bagotville, Quebec and 434 Tactical Fighter (Operational Training) Squadron, Cold Lake, Alberta, flew a variety of tactical support missions from northern airfields. These included Goose Bay, Labrador; Churchill, Manitoba; Fort St. John, B.C.; and Whitehorse, Yukon.

Providing a long term military presence in the Arctic, the DEW Line consists of one main and 17 auxiliary radar sites which are strung across the Canadian Arctic from Cape Dyer in the east to Komakuk Beach near the Alaskan border.

Air Reserve Otter aircraft from 400 Squadron and 411 Squadron, Toronto, flew settlement and airfield surveys from Churchill to the eastern Arctic. The western Arctic support was provided by 418 Squadron, Edmonton, for exercise "WAMMOK MAKER 3" in the Fort Selkirk area. Flights were also conducted at Whitehorse in support of an air cadet familiarization flying program.

### Plans for 1974-75

#### Maritime Forces

Plans call for maintenance of the present level of air and surface activity, consistent with the primary tasks and resources

assigned to Maritime Command. In addition to the regularly scheduled NORPLOY by a fleet replenishment vessel, a surface group of two destroyers will join her to exercise in Hudson Bay for two weeks in August. Support to other government agencies will be increased, consistent with increasing demands for information about, and surveillance of, the Arctic.

### Land Forces

The new Viking series of exercises will continue. In addition, there will be a series of no-notice exercises — "Quick Viking". The location for these exercises is also expected to be Fort Churchill.

Exercise "Ready Now III" will be a Canadian Airborne Regiment exercise, taking place in May 1974, in which the regiment will deploy with minimum provisions along the Alaska highway.

Exercise "Patrouille Nocturne II" will be a 5e Groupement de Combat winter exercise in the Fort Churchill area in February 1975. The Canadian Airborne Regiment and the 1st Canadian Signals Regiment will also take part in this exercise.

As announced by the Minister of National Defence, Canadian Forces Station Churchill will be activated on 1 April 1974. This station will be the northern training centre for the Canadian Forces. Although defence facilities will be located in the former military encampment, all permanent residences will be located in Churchill as part of the federal-provincial construction program. The Northern Training Centre will be responsible for conducting the "New Viking" series of arctic training exercises and instructor courses, as well as providing support for major exercises involving the land forces and tactical air elements.

In June, airfield construction will resume at Cape Dorset and Pond Inlet, and a 4,000 foot strip will be started at Eskimo Point. Completion of these tasks is scheduled for 1975. Work on the Eagle River bridge will commence late in the year.

### Air Forces

Hercules aircraft will continue to fly regularly to Alert, Inuvik and Yellowknife. Buffalo aircraft will provide support for the northern airfield construction program during the spring, summer and early fall. The two Twin Otters at Yellowknife will continue to provide essential service to Northern Region Headquarters.

CF5 tactical fighters of 10 Tactical Air Group will fly operational training missions,



including photographic reconnaissance, from several northern airfields in support of land force exercises.

Air Reserve Otter aircraft will continue to survey settlements and airfields in the Arctic. Reserve aircraft will support the National Cadet Camp this summer at Whitehorse and Yellowknife. Numerous flights will be necessary for cadet field training which includes parachute drops of supplies and air reconnaissance missions.

## DEFENCE RESEARCH BOARD

### Responsibilities

To bring to the Canadian Armed Forces scientific knowledge and experience in solving problems of military operations in high latitudes, and to sponsor and undertake related research projects.

### Long-term Plans

Research will be conducted both in the laboratory and in the field. Almost every aspect of science is involved, categorized as follows:

- Research directed to protecting the soldier and his equipment from the environment.
- Research on the effects of the environment on systems used by the Canadian Forces to generate and transmit information necessary for command and control, and on the effects of the environment on the Canadian Armed Forces' ability to conduct operations in the North.
- Research directed to the protection of the environment from the effect of military operations.

### Review of 1973-74 Operations

Research was conducted at the Board's laboratories across the country; these studies are functional and multi-disciplinary. The broad work categories outlined above overlap in several laboratories, so the following list is limited to giving some idea of the number involved and their general field of interest.

- Defence Research Establishment Atlantic — (Arctic acoustics)
- Defence Research Establishment Valcartier — (Military engineering, remote sensing)
- Defence Research Establishment Ottawa — (Effects of the environment on operations in the North, protection of the

individual soldier, remote sensing, military radar and communications)

Defence Research Analysis Establishment — (Operational research)

Defence and Civil Institute of Environmental Medicine — (Protection of the individual soldier. The effects of the environment on operations in the North. Remote sensing from the human engineering point of view)

Defence Research Establishment Suffield — (Military engineering, protection of the individual soldier)

Defence Research Establishment Pacific — (Arctic acoustics)

The Board has also supported research in the North by means of grants and contracts to universities, non-government research organizations and, to a small degree, to Canadian industry. Facilities and goods and services were provided to other government agencies and close collaboration was maintained with research and development agencies in other countries, especially the United States and Great Britain.

### Research directed to protecting the soldier and his equipment

Work was concerned with improving certain aspects of clothing, as well as physiological and immunological research.

The testing of arctic clothing, in co-operation with the Arctic Petroleum Operators Association, and further tests on electrically heated clothing were concluded. In the latter case, heated gloves with either wires or conductive rubber elements, and a heated wrist cuff were tested. The cuff is based on the idea that heating blood flowing to extremities may solve the problem of poor circulation. Wire elements in gloves tend to have hot spots which do not occur with conducting rubber elements. All forms of heated clothing presuppose a source of plug-in energy and would therefore be used only in a repair-maintenance situation where this was available.

A clothing-item of interest is a new parka-style helmet designed to minimize the problem of spectacle fogging. This is a three-piece unit consisting of a close-fitting cap-helmet to which is fastened a light curtain face mask. An outer helmet with a window fits over these, snapping to the cap-helmet and having a skirt long enough to lie loosely on the shoulders. Because of the loose shoulder fit, dry outside air can enter. There are zippers over the visor and on the top of the helmet for egress of air. In operation, breath is trapped behind the curtain

mask which is warmed by the latent heat of condensation. The cold dry air entering the bottom is warmed by the dry outside surface of the face curtain and flows across the eye to the vent. The assembly is light and turns with the head so that one does not have to turn the body as with the present parka hood tunnel.

A second item of interest is a cold wind chill meter. It is designed to give a single readout for wet-and-dry-bulb temperatures and solar radiation, and to allow a military commander to evaluate what can be done under a given set of environmental conditions. Further developments of this meter in 1974-75 will extend the assessment to include other factors such as clothing.

Further medical research has confirmed the efficacy of Vitamin C in reducing the incidence of upper respiratory symptoms. No answers are yet available on frostbite but the index of susceptibility devised does show some correlation with chemical indicators in the blood. It has also been shown that there are changes in resistance to disease as a result of cold exposure, and laboratory tests with animals show there is a large increase in resistance to cold with increase physical fitness. This work will continue in 1974-75.

The continuing work on immunology involved examining sera from indigenous wild life and sentinel animals and birds for the presence of antibodies to a variety of viral and bacterial microorganisms pathogenic to humans. Also involved was the examination of sera from paired blood specimens from Canadian Forces construction engineering personnel and men on New Viking training exercises. Results of this work indicate that there are microorganisms pathogenic to humans in wildlife in the North. However, the hazard to man entering remote regions of the North has not yet been established. Further work will look at arbovirus to determine prevalence of potential agents of human illness on the tundra of the central Arctic. In 1974-75 virus isolation will be attempted on blood samples from small mammals and birds, sentinel animals and mosquitoes.

Tests of a mobile shelter — one which would combine housekeeping and vehicle functions took place in Churchill and Yellowknife in the winter of 1973. The mobile shelter — a two-man model — provided comfortable living and driving conditions for its crew. Design was also adequate in that no internal frosting of windows or serious thermal leaks were found. After

the conclusion of these trials the mobile shelter was refitted to overcome some chassis engineering problems and to conform to the requirements of a mobile medical evacuation unit. It was evaluated in this role in the early winter of 1974.

Work on protecting the hearing of operators using snowmobiles has shown that even with quiet machines which meet the criteria of 75 decibels at 50 feet, the noise level to the driver is over 100 decibels so that, for long operation periods, ear protection is needed.

### Environmental parameters

Work on sea ice included continued flights over Nares Strait using, in addition to the normal search radar and the human eye, side-looking airborne radar (SLAR), and infrared line scanner and a laser profilometer. When these last two sensors were carried, the flight continued beyond Alert to the Pole. The SLAR provides increased information about the ice and can, for example, allow selection of large level sections of ice that can be used as landing strips for VSTOL aircraft giving greater flexibility in the selection of on-ice work positions. SLAR also allows much better detection of ice features such as individual floes, leads and cracks; with individual floes can distinguish the rough ice from smoother ice. For example, analysis of the patterns formed by leads and cracks shows them parallel to northern Ellesmere at the tip of Nares Strait, then changing to perpendicular to this direction and finally, at the Pole, to more or less random patterns. Summer movement of ice floes in Beson Channel was charted using a time-lapse television technique that composites the immediate scene with a pre-recorded one by the use of difference imagery. This technique will be used in 1974-75 along with radar tracking in the final data-gathering expedition to this site. Analysis of previous years, data is continuing, and after the summer of 1974 there should be sufficient synoptic data to construct a reasonable picture of future ice-floe patterns.

A second data-gathering cruise in northern Baffin Bay was made by Canadian Auxiliary Vessel, Quest. The purpose of the cruise was to study ambient background noise, with particular emphasis on investigating the influence of icebergs and accumulations on noise, and investigating the directivity. These experiments involved

taking standard B-T curves and other oceanographic data. It is not planned to make a similar cruise in 1974 and effort will be directed at completing analysis of data in hand.

Two investigations of Makinson Inlet were made during the year, one in the spring of 1973 when observations on the ice cover in the inlet as well as on the water parameters were made, and a second in summer when HMCS *Protecteur* visited the area. On the latter expedition an anchorage and harbour site was surveyed, beaches examined, and possible airstrip locations which had been determined in the spring visit were confirmed by examination with operational officers from the ship. The conclusions are that the inlet has an excellent anchorage and several possibilities for a good strip with minimum work. The area is suitable for a number of temporary, semi-permanent or permanent uses by DND.

### Remote sensing

The parameters for specifying performance of infrared line scanners have been established and work on contrasts between targets and background has helped define the limitations of infrared equipment in such applications as search and rescue in the Arctic. Work was also done investigating the use of near infrared television videcon tubes and infrared cameras under conditions of whiteout at Yellowknife. It was shown that near infrared does give better definition to the horizon than does the naked eye, but the advantage is not a large one. A study of near infrared television as an aid in identifying ice from the decks of ships operating in ice-strewn waters was also carried out. It indicates that television is better than the unaided eye but is not always demonstrably better than the eye aided by binoculars in detecting ice, although with the greater field of view of television greater detail results. In 1974-75 further measurements will be made on the contrast between targets and background in selected Arctic regions.

During the year a detailed contract study of imagery from real aperture sideways looking airborne radar (SLAR) delineated the uses and limitations of this equipment in gathering information for terrain analysis. Also, as an adjunct to terrain analysis, studies are being made on imagery from the Earth Resources Technical Satellite (ERTS).

One study is based on the fact that data input is a normal vector for each ground

point and that the vector elements from many ground points show covariance patterns differing according to ground type. A covariance matrix is rotated to a basis where the vector elements are independent. The three most informative vectors are then chosen as a basis for colour space formed by nonlinear transformation to colour gun values (red, green and blue). The resulting false colour image brings up much more external information than is apparent in the original imagery. A library of matrices has been built and the technique has been shown to be stable. Various transformations have been tried on ERTS imagery with definite advantages in defining textural features. This work will continue in 1974-75.

The second study on imagery uses data which are analyzed to obtain spectra across the four bands to determine whether textural difference in the terrain can show up in ground areas smaller than the resolution cell of the satellite. This work will continue through 1974-75.

### Military engineering

Continued work on slurry explosives has shown that through the use of additives and by changing the composition slightly they can be used in temperatures of  $-40^{\circ}\text{F}$ . They can be pumped, poured into holes, and are safe to handle and transport. Their extended temperature range now puts these materials at the disposal of the northern engineer. Work has also been done on castable explosives and these too can be used in extremely low temperatures. Two forms exist, cast pellets consisting of fine grain sized (1/8" - 3/16" diameter) graphite coated material which is free-flowing and pourable and large cast sizes, for example lipstick tube size, for such specialized uses as blasting holes in frozen ground for tent pegs.

Investigations continued in an attempt to relate draw bar pull obtainable on various types of terrain to the terrain parameters identified by simple identifier field tests; investigations directed to an understanding of the action of tires on snow covered surfaces; and investigations directed to improving grouser design for tracked vehicles operating on snow covered and soft terrain.

Work on power sources included initiation of studies of low temperature charge acceptance in the lead storage battery - a major cause of overall poor low-temperature performance with this system, completion of



a magnesium/silver chloride battery capable of operating an AN/URT 503 locator beacon for search and rescue for 18 hours at  $-40^{\circ}\text{F}$ , and testing of a lithium/sulphur dioxide battery capable of operation at peak drain for 30 hours at  $-40^{\circ}\text{F}$  and at more moderate drain for 150 hours at  $-65^{\circ}\text{F}$ . However, there are problems of safety and explosion hazards with the latter cells and tight specifications and more rigid manufacturing controls are necessary before general use. Work on metal/air systems has resulted in air electrodes that do not contain precious metals and give performance almost as good as that obtained with silver catalysts. An external contract has been let for development of a zinc/air battery for the AN/TRAN 30 non-directional beacon capable of operating for two hours at  $-40^{\circ}\text{F}$ .

#### Research on communications

There was continuing effort on high frequency communications as well as the use of the portable satellite communications terminal with advantage being taken of the voyage of HMCS *Protecteur* to the North to conduct various experiments. Once again satellite communication provided a reliable continually available link to the south from areas as far north as Makinson Inlet. Further experiments are planned for the 1974-75 deployments.

#### Operational research

Effort was again applied to problems of search and rescue (SAR). Analyses were made of such factors as suitability and availability of aircraft and crews, and impact of weather, environment and geography on distress air accidents. Rules have been promulgated with respect to handling and starting beacons in order to optimize the signal and possibility of detection, and these rules have been published in a popular flying magazine. Analysis of SAR problems in the Arctic with particular reference to spurious beacon detections will continue in 1974-75.

#### Protection of the environment from military operations

Most of the work under this heading is done extramurally and is concerned with the effects of disturbing ground and ground cover. One grantee went back to look at ruts made at Churchill during vehicle testing twenty years ago and compared the present aspect of the ground with the records of damage then. The conclusions were that recovery had occurred except where the ground was stoney with thin overlaying soil. The regrown species were not the same as in the original cover. A second similar piece of

work is being done in the Lake Hazen area and will be documented in 1974-75.

Operational research staff have developed techniques for evaluating the social impact of military bases on surrounding communities and, after testing their model in southern situations, are now prepared to do this in the North if required.

#### Plans for 1974-75

The research program of DRB will be pursued along similar lines. However, emphasis does change as results of research are adopted and new problems tackled under the broad headings which we have used to describe our research.

#### Contracts 1973-74

With McGill University for:

- Research on the physics of sea ice.
- Research on field mobility correlation devices and contact mechanisms.

- Research on the classification and evaluation of terrain.
- Research on vehicle mobility and trafficability on snow covered surfaces.
- Evaluating remotely sensed imagery from exercise Good Look.

With the B.C. Research Foundation for research on juvenile hormone analogue as an insect growth regulator.

With the University of Montreal to evaluate a carbamate blackfly adulticide against mosquitoes and to evaluate new types of spraying equipments.

With Bombardier to evaluate optimum track components for marginal terrain vehicles.

With the Arctic Institute of North America:

- contract for general library support, and

With other government departments, financial assistance towards the North Water Study.

## UNIVERSITY GRANTS PROGRAM

### *Electrical Power Sources for Military Applications*

University	Title of Research Project
Calgary	Electrical power systems for remote, unattended locations

### *Military Transportation and Vehicle Engineering*

Memorial	Effects of tracked vehicles on high arctic tundra
Calgary	Stabilization of arctic sands
RMC	Evaluation and stabilization of highly compressible terrain for use as V/STOL landing sites
New Brunswick	Military vehicle rut history in permafrost of Fort Churchill muskeg
Queen's	Stability of airfield and foundation pads on muskeg
Saskatchewan (Regina)	Northern Canada transportation study
Carleton	Characteristics of air cushion vehicle-terrain interaction
Carleton	Effect of vibration on off-the-road vehicle mobility
Sherbrooke	Conversion of aeolian energy into thermal energy
RMC	Water treatment plant waste disposal
Queen's	Slurried explosives
Calgary	Microstructural investigations of frost action in building materials and soils
Calgary	Temporary enclosures for the North
Calgary	Development of materials for engineering construction in northern Canada
Calgary	Military equipment defroster
Alberta	Fundamentals of shipboard icing



*Geotechnical Aspects of Defence Operations*

Memorial Sherbrooke	Iceberg cross-section echo Remote infrared radiometric detection of soils and vegetation
McMaster	Soil characteristics, terrain mapping and terrain analysis in the Arctic
Guelph	Orthophoto development
Memorial	Prediction of iceberg drift off eastern Canada
New Brunswick	Orientation problems with unorthodox imagery in air space systems
New Brunswick	Panoramic photography analysis on the analytical plotter AP/2
RMC	Remote sensing and surveillance — thunder- storms and fire
McMaster	Photo-interpretation and mapping in Resolute area
Dalhousie	Geophysical studies in Baffin Bay
McGill	Measurement of water-drag coefficient of an ice cover
AINA	Baffin Bay North Water Project
New Brunswick	Rectification and correlation of infrared imagery using the analytical plotter
McMaster	An investigation of beach characteristics in the Arctic
Laval	Interaction of ice with offshore installations
Queen's	Strength of frozen soils
Alberta	Slope stabilization in permafrost
McGill	Engineering properties of frozen soil
McGill	Thaw stability of permafrost
Laval	Study of permafrost in Schefferville region
Guelph	Pressure-sphere anemometer for arctic use

*Military Preventive Medicine*

Manitoba	Colonization and egg diapause in <i>Aedes</i> mosquitoes
Waterloo	Juvenile hormone for mosquito control
Alberta	Digestive physiology of medically important insects
Memorial	Mermithoid parasites of blackflies
Alberta	Synthesis of insect hormones: new pesticides
Toronto	Structure of mosquito sensory receptors
Macdonald College McGill	Dynamics and morphology of the biting midge
Waterloo	A study of reproduction in some medically important insects
Lakehead	Blackfly control by chemical methods
Waterloo	The control of northern mosquitoes by mermithid parasites
Manitoba	Relevance of psittacosis — L.G.V. antibodies in residents of the Arctic

*Physiological and Metabolic Stress in Military Environment*

Manitoba	The effects of temperature, energy availability and hypoxia on bioenergetics and metabolism in cold-climate mammals
Toronto	Influence of diet composition and feeding pattern on cold-tolerance in rats
York	Physical fitness and adaption to cold and altitude stresses

Calgary	Cold water immersion, arterial blood $p\text{CO}_2$ and brain blood flow
Laval	Assessment of cold reactivity by autonomic nervous system responses

*Human Performance and Human Engineering*

Waterloo	Human response to buffeting and vibration in snowmobiles and all-terrain vehicles
Manitoba	Effect of adverse environmental conditions on intellectual and perceptual processes

*Political, Economic and Strategic Studies for Defence*

Dalhousie	Operational research studies relating to the North
Laval	Sovereignty and continental defence

**EXTRAMURAL RESEARCH GRANTS IN FORCE PENDING CLOSURE  
1973-74**

University	Title of Research Project
Victoria	Model studies of reverberation from sea ice
Queen's	Ditching with slurried explosives
New Brunswick	A national inventory for muskeg types

## DEPARTMENT OF NATIONAL HEALTH AND WELFARE (NH&W)

### HEALTH PROGRAMS BRANCH

#### Responsibilities

To make accessible high quality health services to all residents of Canada regardless of their place of residence or ability to pay. The Branch administers the Hospital Insurance and Diagnostic Services Act (implemented in 1958) and the Medical Care Act (implemented in 1968) which enable the Federal Government to contribute, on the average, half of the costs of the insured services of the national programs which are incurred by provincial and territorial hospital insurance plans and medical care insurance plans which meet certain specified criteria of the federal legislation. These criteria are:

- comprehensiveness of the insured services,
- universality of the coverage which must be provided under equal terms and conditions to all eligible residents,
- portability of the coverage when an insured person is temporarily absent or moving to another province or territory, and
- administration on a non-profit basis by a public authority.

The federal legislation gives each province or territory considerable leeway in determining the administrative arrangements for the operation of its plans, in deciding how the share of costs will be financed (e.g. through premiums, sales tax, other provincial revenues or by a combination of methods), in deciding whether coverage will be on a voluntary or compulsory basis and whether or not services additional to those of the national programs will be included in provincial plans. Any additional benefits are, of course, not eligible for cost-sharing. In 1973-74 the Federal Government contribution is estimated at \$1,512 million

as its share of the provincial and territorial hospital insurance plans. The federal contribution to the Yukon is estimated at \$1.01 million or 74.7 per cent of the cost of insured services of the national program covered by the Yukon Hospital Insurance Plan. The corresponding figures for the Northwest Territories Hospital Insurance Plan are estimated at \$2.5 million or 47.9 per cent.

In 1973-74 the Federal Government contributed approximately \$696 million under the Medical Care Program as its share of the provincial and territorial medical care insurance plans. The estimated federal contribution to the Yukon for costs incurred by the Yukon Health Care Insurance Plan in 1973-74, is \$620,000 or 54 per cent of the costs of insured services. The corresponding figures for the Northwest Territories Health Care Plan are \$1,147,000 or 69 per cent.

The Branch is also responsible for the management of the Health Resources Fund, which was established in 1966 in the amount of \$500 million to be spent over the following 15 years to assist the provinces in meeting the national needs for new and improved facilities for the education of health manpower and for health research. Another major responsibility is the administration of an expanding program of health grants for research, and innovation in methods of delivery of health care. The Branch also has a major economic and statistical directorate which provides economic and social research support for health policy planning and development. Consultant services are also provided by the Branch to the provinces and territories when required both in connection with the operation of their health insurance plans and also to assist them in planning and implementing changes in their health care delivery systems.

#### Review of 1973-74 Operations

There was a substantial improvement in the eligibility and portability provisions of the provincial and territorial hospital and medical care insurance plans. The Federal Government continued to discuss with the provinces ways and means of improving flexibility in the federal-provincial arrangements with particular emphasis on promoting a more efficient and economic health care system. The Medical Care and Hospital Insurance Directorates were amalgamated as the Health Insurance Directorate, effective April 1, 1973. A Community Health Directorate was established to serve as the branch focus for the development, in collaboration with the provinces, of programs aimed at promoting lifestyles which will contribute to a high standard of personal health and to advance the development of comprehensive community health services.

#### Plans for 1974-75

The provision of financial support to the provinces and territories, consultant services, advisory and research support will be continued. It is expected that the first graduates from the two-year course at the School of Dental Therapy, Fort Smith, Northwest Territories, will graduate in 1974 as dental auxiliaries. The Federal Government contributed \$106,875 of the construction costs of the school to the territorial government from the Health Resources Fund.

#### Long-term Plans

Further integration of the major health services, improved access and continued work in developing alternatives (institutional and ambulatory) to acute general hospital care for persons who do not require the intensity of care characteristic of such hospitals.



## MEDICAL SERVICES — NORTHERN REGION

### Responsibilities

Through its Northern Health Services, the Medical Services Branch of the Department of National Health and Welfare is responsible for developing total health care in the north. It plays a dual role in providing health services to all northern residents, acting in the capacity of a provincial health department for both Territories, the Territorial councils enacting health ordinances.

The governments of the Yukon and the Northwest Territories operate health insurance plans in much the same manner as do provincial governments elsewhere in Canada.

### Long-Term Plans

Continual efforts will be made to gain the maximum participation of the northern populations in health activities; to restore public health engineering advisory and environmental health and sanitary inspection services to adequate levels; to increase the flow of health related information to the governments of the Yukon and Northwest Territories, and to federal departments, community groups and associations interested in health services; to encourage more involvement of residents in hospital advisory boards and health committees; and to develop further para-medical personnel training programs.

### Review of 1973-74 Operations

The Dental Therapy School gave instruction to students in second year for the first time which in the spring of 1974 culminated in the graduation of eight dental therapists trained in simple restorative dentistry (fillings) and in the extraction of primary teeth, as well as in the educational aspects of dental health and in prophylactic procedures such as fluoride applications.

These dental therapists are all young native northerners who will work under the general supervision of qualified dentists in extending the volume of dental education and dental care in northern settlements.

The Community Health Auxiliary Programme (CHAP) provided training by means of two intensive short courses, and 40 week apprenticeships to prepare native workers for employment as Community Health Representatives.

This program provided for the identification of suitable workers at the local level, by an Indian Band, or Settlement Council,

or, in some cases, on recruitment by the settlement nurse. The six week course was given at either Fort Simpson or Pangnirtung. Thirty went through the initial training period.

A technical training programme designed to increase the diagnostic and clinical skills of nurses in isolated outposts was provided at five universities at which were enrolled a total of 19 nurses from the Yukon and the Northwest Territories. In addition, three nurses attended the more extensive Outpost Nursing course at Dalhousie University during the year. A total of 22 nurses were involved in these post graduate educational projects in 1973.

An intensive study of perinatal morbidity and mortality was made in the Northwest Territories with financial support from the National Health grants.

Plans for the International Symposium on Circumpolar Health to be held at Yellowknife in July 1974 were developed and the program organization was completed. Delegates up to about 300 in number, will be attending from all countries having an interest in the health conditions of the Arctic.

An arctic survival kit for air evacuation emergencies was developed. Kits were issued to every nursing station and hospital from which emergency flights could be undertaken.

Facilities completed during 1973 include:

Inuvik — commencement of construction of a new wing to accommodate the outpatient department, the administrative offices, public health and a new paediatrics ward.

Tuktoyaktuk — the nursing station was augmented by a trailer for the accommodation of transient health personnel.

Arctic Red River — relocation of the health centre to a better site in the community.

Norman Wells — renovations to the temporary nursing station.

Paulatuk — electrification of health station.

### Keewatin Zone:

Rankin Inlet — expansion of the nursing station.

### Mackenzie Zone:

Fort Simpson — completion of the hospital — health centre complex. Edzo — construction of the hospital — health centre complex.

Detah — replacement of the clinic trailer destroyed by fire.

### Yukon Zone:

Deatoh Bay — construction of a nursing station.

Whitehorse — (a) relocation of public health offices.

(b) minor structural addition to laundry facilities and refurbishing of wards at Whitehorse General Hospital.

### Plans for 1974-75

#### N.W.T

Eskimo Point Nursing Station renovations  
Inuvik General Hospital kitchen renovations  
Inuvik General Hospital renovation — continuing project.

Norman Wells — new nursing station — first year of two-year project.

Sachs Harbour — installation of a transportable nursing station purchased in 1973-74.

Edzo — completion and operation of the hospital health centre complex commenced in 1973-74

Cambridge Bay — installation of a nurses' residence purchased in 1973-74.

Cambridge Bay — expansion and renovation of the nursing station

Snowdrift — installation of a waste disposal system.

Frobisher Bay General Hospital — installation of a new pathological incinerator.

### Yukon

Pangnirtung — construction of a new nursing station

Pelly Crossing — addition of two units to existing clinic trailer to increase to nursing station status.

Ross River — purchase and installation of a transportable nursing station.

Faro Nursing Station — development of plans for expansion

Watson Lake — commence construction of a hospital — health centre complex. (two year project).

Whitehorse General Hospital — (a) installation of a standby boiler. First year of a two year project.

(b) installation of new fire alarm

(c) installation of a stores freight escalator.

(d) window replacement. Second year of continuing program.

## FINANCIAL ALLOWANCES AND SERVICES IN THE NORTHWEST TERRITORIES

### The Canada Assistance Plan

The Canada Assistance Plan was enacted in 1966 to support the integration, broadening and improvement of the public assistance programs of the provinces and territories and their municipalities, and to encourage the extension and development of welfare services. Under the plan, contributions amounting to fifty per cent of shareable costs are made toward provincial, territorial and municipal expenditures for public assistance and welfare services.

The Canada Assistance Plan has two primary objectives: to help provide adequate assistance to persons in need, and to encourage the development and extension of welfare services intended to prevent and relieve the causes of poverty and dependence on public assistance.

All provinces and territories have signed agreements under Part I (General Assistance Welfare Services), the Yukon Territory in December 1969 and the Northwest Territories in February 1973.

Discussions were held about the possibility of entering into agreements for the administration of Indian Welfare, under Part II (Indian Welfare) of the Plan. Because of a lack of unanimity among the provinces and various native people's groups, it is unlikely that the provinces will sign agreements under Part II in the immediate future. Under Part III (Work Activity Projects) of the Plan, provision is made for special employment preparation programs to help improve the motivation and work capacity of persons who have been unable to take full advantage of training, or who have unusual difficulty in finding or keeping a job.

In addition to the cost-sharing arrangements, the Canada Assistance Plan Directorate makes available to the provinces and territories, at their request, consultant services in areas such as income support, day care, child welfare, institutional care, community development and work activity. The Social Care Information Centre which was established in 1972 provides information on all aspects of day care to any interested person. The Canada Assistance Plan Directorate administers the Vocational Rehabilitation of Disabled Persons (V.R.D.P.) program which was transferred from the Department of Manpower and Immigration to the Department of National Health and Welfare on April 1, 1973. Neither territory has signed agreements under the V.R.D.P. Act.

### Expenditures under the Canada Assistance Plan in the Yukon Territory

1972-73	1973-74 Estimate	1974-75 Forecast
\$700,000	\$786,158	\$1,400,000

### Expenditures under the Canada Assistance Plan in the Northwest Territories

1973-74 Estimate	1974-75 Forecast
\$1,372,984	\$2,300,000

### Other Welfare Programs

Before agreements were made under the Canada Assistance Plan, the Federal Government contributed to the provinces and territories 50 per cent of their assistance payments under the Unemployment Assistance Act as passed in 1956 and amended in 1957.

### Expenditures under the Unemployment Assistance Act in the Northwest Territories

1972-73	1973-74 Estimate
\$1,014,394	\$486,175

As the Canada Assistance Plan agreement with the Northwest Territories supersedes the agreement under the Unemployment Assistance Act, there will be no expenditures in the future under the Act. A portion of the Northwest Territories assistance caseload for 1972-73 was covered under the Canada Assistance Plan. Estimated costs for 1973-74 cover only a residual caseload which has not yet been transferred under the Canada Assistance Plan.

The Federal Government has entered into agreements with both the Yukon Territory and the Northwest Territories under the Blind Persons Act and the Disabled Persons Act. The Blind Persons Act provides for federal contributions of 75 per cent of the amounts paid by the provinces or territories for allowances up to a maximum of \$75.00 a month, to blind persons 18 years of age and over who are eligible for such payments on the basis of a means test. The Disabled Persons Act provides for federal payments of 50 per cent of the amount up to \$75.00 a month paid by a province or territory to disabled persons aged 18 or over who qualify under a means test. Both of these categorical programs are being phased out. Many of the recipients of these allowances have been transferred or will receive some assistance under the general assistance programs of the

provinces and territories; these expenditures are eligible for cost-sharing under the more comprehensive provisions of the Canada Assistance Plan.

### Expenditures under the Blind Persons Allowances

	1972-73	1973-74 Estimate	1974-75 Forecast
N.W.T.	\$19,284	\$15,000	\$15,000
Y.T.	\$ 3,037	\$ 2,000	

### Expenditures under the Disabled Persons Allowances

	1972-73	1973-74 Estimate	1974-75 Forecast
N.W.T.	\$15,659	\$12,200	\$10,000
Y.T.	\$ 2,250	\$ 1,900	

### Family Planning

The objective of the federal family planning program is to ensure the accessibility and availability of family planning services to all Canadians who want them. The program of the Family Planning Division, which was created in 1972, includes the purchase, publication and free distribution of literature on family planning and sex education; the provision of consultation on family planning matters to provincial, territorial and municipal departments of health, welfare and education, and to a broad range of non-governmental agencies; assistance in the training and education of health and welfare personnel; and the administration of a family planning grants program.

During 1973-74, family planning and sex education literature and audio-visual materials were sent to communities in the Yukon and Northwest Territories. At the request of the Northwest Territories Family Planning Association, the Family Planning Division conducted workshops in Yellowknife and Fort Smith for social workers, nurses, teachers and native home-management trainees.

## DEPARTMENT OF NATIONAL REVENUE

## CUSTOMS AND EXCISE

## Responsibilities

To administer the customs and excise laws and regulations, particularly the customs control of movement of aircraft and vessels.

## Long-term Plans

To maintain the present level of customs service in this area and to increase service where it is indicated that continuing development of the North will require customs surveillance.

## Review of 1973-74 Operations

The local port of Whitehorse under the purview of the Regional Collector, Vancouver continues to administer customs laws and regulations throughout the Yukon Territory. The Territory is serviced by all modern transportation media engaged in the importation and exportation of goods and the international movement of passengers. To accommodate this traffic, customs outposts were maintained at Beaver Creek, Carcross, Dawson, Old Crow and Pleasant Camp. Customs formalities at Old Crow are performed by the R.C.M.P. Six locations were approved as customs airports of entry and service was provided for highway sufferance warehouses at Whitehorse and Dawson. Special arrangements were made to accommodate river traffic leaving and re-entering Canada on the Yukon-Porcupine River route.

The port of Edmonton provides service to a Vessel Reporting Station for aircraft at Yellowknife, N.W.T., on 72 hours notice and maintains an outpost for enforcement purposes at Inuvik, N.W.T. Service at Yellowknife is performed by officers from Edmonton on an "on call" basis. Service for Inuvik is provided by a local resident who is

employed on a part time basis. The R.C.M.P. continue to provide service at Frobisher Bay, N.W.T., an outpost under the jurisdiction of the Port of Goose Bay, Newfoundland, which is administered by the Area Manager of St. John's.

During the year exploration activities both of a commercial nature in the development of oil and mineral resources and in the non-commercial activities, such as geographical and mountaineering expeditions continues with increasing intensity. The oil exploration activities with the attendant increased cargo deliveries into northern areas have required closer surveillance by customs personnel in this respect. Interest in this activity is dictated by the need to protect the revenue with respect to imported goods and to assess the adequacy of reporting and accounting procedures. Officers from the Port of Edmonton continue to make several journeys into the Territories to examine these aspects of the Department's interest.

There was a continuing increase in vessel cargo deliveries during the period covered by this report. The main shipping activity is the delivery of oil exploration supplies and stocks of fuel oil to various locations in the territories, especially to the arctic archipelago. In all, the number of vessels engaged in various cargo movements has increased and Ministry of Transport icebreakers continue to be active in this area. With respect to all these movements, it must be noted that the co-operation of the members of the R.C.M.P. and the government departments performing customs enforcement functions for this Department were an invaluable asset to this activity.

Locations for customs service in the North, other than at the places described above, under the jurisdiction of the Ports of Whitehorse, Edmonton, and Goose Bay are tabulated below under the headings of the

government department or service whose employees perform the duties.

## Royal Canadian Mounted Police

Baker Lake	Pangnirtung
Cambridge Bay	Pond Inlet
Cape Christian	Resolute Bay
Coppermine	Sachs Harbour
Eskimo Point	Spence Bay
Lake Harbour	Tuktoyaktuk

## Department of National Defence

Cape Dyer

## Ministry of Transport

Coral Harbour

## Department of the Environment

Alert	Isachsen
Eureka	Mould Bay

## Plans for 1974-75

Owing to increased acceleration of commercial activity in the Territories and the Arctic archipelago, the adequacy of customs control in this area is subject to continuing examination to determine the extent to which customs surveillance and service will be improved. Three new locations for customs will be established.

Revenue and Expenditure  
Whitehorse, Yukon

Fiscal Year	Revenue	Expenditure
1972-73	553,364	238,073
1973-74	557,187	444,897

With the exception of the Yukon Territory all customs offices in the Territories are accountable to financial responsibility centres at customs ports in the provinces.



## DEPARTMENT OF PUBLIC WORKS (DPW)

### Responsibilities

The Department of Public Works, the principal construction arm of the federal government, undertakes a wide range of construction and maintenance work in the North, usually at the request of other government departments having responsibilities in the North. The Department provides architectural, engineering and construction services, and assists in planning, investigation, economic feasibility studies design, as well as construction and management of buildings, public utilities, highways, harbours and wharves. It is also responsible for the acquisition and disposal of lands and properties, for the leasing of office and other space when Crown-owned space is not available, and for the upkeep of a great number of federal buildings in the North.

Public Works has a continuing responsibility for the development and maintenance of navigable waterways in the North. It is responsible for the construction and upkeep of the northwest highway system, including the Alaska Highway and the Mackenzie Road. The Department provides an engineering service to the Department of Indian and Northern Affairs for the location, design and construction of roads under the Northern roads program, which includes two or more links in the North — the Dempster and Mackenzie highways.

Accommodation, construction, marine and airway operations in the North are the responsibility of the Department's regional offices in the Pacific, Western and Quebec Provinces.

### Western Region:

#### Accommodation Operations:

A continuing program of federal housing at Yellowknife, Inuvik, Ft. Smith, Hay

River, Ft. Simpson and Pine Point is underway. The construction of the 1973-74 Federal Housing Program is expected to be completed by July of 1974 with the exception of Yellowknife where completion is scheduled for October 1974. The 1974-75 Federal Housing Program is now in the planning stage with construction scheduled to start at all of the above locations between August and September 1974.

At Inuvik, post office facilities were expanded in the Federal Building and a new trades shop was constructed.

In Yellowknife a seismology building is under construction for Energy, Mines and Resources, a major addition to the R.C.M.P. complex is underway and a resources building for Indian and Northern Affairs has been designed and may proceed this coming year.

The Inuvik General Hospital is being expanded for National Health and Welfare, a new hospital is under construction at Edzo and a nursing station is approaching completion at Rankin Inlet. The Cambridge Bay Nursing Station is scheduled to be expanded, and a start on a new clinic in Norman Wells is expected.

Cell cabins were constructed at Ft. Simpson and Ft. Good Hope and work was completed at Ft. Liard, Ft. McPherson and Ft. Providence for the R.C.M.P.

An environmental laboratory is nearing completion at Hay River and a trailer park site was purchased at Yellowknife for the Department of Environment.

#### Highway Operations

1973 saw the completion of clearing, grading and drainage of a 33-mile section of the Mackenzie Valley Highway southerly from the Inuvik Airport Road, and the completion of the clearing, grading and

drainage of a 35-mile section of the Dempster Highway between Fort McPherson and Arctic Red River.

Good progress was made on the clearing, grading and drainage of a 40-mile section of the Dempster Highway running north from Arctic Red River to connect with the Mackenzie Valley Highway south of Inuvik. Approximately 20 miles of this section were graded in 1973.

Clearing, grading and drainage continued on the 50-mile section of the Mackenzie Valley Highway between Fort Simpson and Camsell Bend. Approximately 20 miles of grading were completed in 1973.

"Hire North" an entity of the Government of the Northwest Territories for the employment of native northerners on the Mackenzie Valley Highway, continued clearing of the right-of-way north of Camsell Bend over a distance of 150 miles. This group also undertook the construction of a 10-mile section of the highway at River Between Two Mountains as a training exercise.

Engineering and environmental studies continued throughout the year over the entire length of the proposed route of the Mackenzie Valley Highway, from Fort Simpson to Inuvik, a distance of 670 miles.

An alignment was established on the ground and preliminary and final designs on sections of this alignment have been submitted to the appropriate Committees for review and approval.

Engineering and environmental studies continued on the 54-mile section of the Dempster Highway from Fort McPherson to the NWT/Yukon border. The design for this section of highway is scheduled for completion in early 1974.

### Marine Operations

Minor repairs and annual maintenance were carried out on the four floating wharves serving settlements on the Mackenzie River, and the fixed wharf at Ft. Franklin settlement.

Repairs were also carried out to the wharf at Ft. Providence, and repairs and improvements to the wharf at Ft. Franklin Camp on the Great Bear River.

Deadman anchors were installed at Sachs Harbour, Gjoa Haven and Poulatuk.

A contract for a new general cargo wharf for Norman Wells was awarded in October 1973; work commenced in November 1973 and is expected to be completed in the fall of 1974.

A contract was awarded and completed for improvements to the access road and storage area at Ft. McPherson.

A contract was awarded for construction of a ferry haulout for the M.V. *Merv Hardie* for Indian and Northern Affairs in June 1973. The work is expected to be completed in 1974.

Departmental floating plant maintenance dredging operations were carried out at several locations along the Athabasca River, within the Athabasca Delta channel, and at Hay River within the harbour and shipping channel. A small amount of capital dredging was carried out within Beaver Lake on the Mackenzie River. Shagging operations were carried out along the Athabasca River.

Extensive salvage operations were carried out at Sans Sault Rapids on the Mackenzie River to remove Dredge No. 251 sunk in 1972.

The field work for the Mackenzie River Survey & Investigation for navigation improvements was essentially completed in 1973. some minor work will be carried out in 1974.

Field surveys in support of our Departmental dredging work were made along the Athabasca River, on the Snye at Ft. McMurray, Alberta, in the east and west channels at Hay River, N.W.T. within the Hay River harbour, at mile 19 on the Mackenzie River and at Sans Sault Rapids.

Surveys were also carried out in support of construction work at four sites. A minor survey was made for the Territorial Government in connection with the grounding of the M.V. *Merv Hardie*. Three advanced planning surveys were also made; one in Ft. Chipewyan, Alta., one at Ft. Norman, N.W.T., and one at Ft. Simpson, N.W.T.

A Phase I investigative report for shoreline erosion at Tuktoyaktuk was submitted

to the Government of the N.W.T. in April 1973.

An engineering and economic justification report for a proposed harbour development project at Ft. Chipewyan, Alberta was submitted to Environment Canada.

### *Pacific Region (Yukon Territory)*

#### 1973-74 Highway Operations

The routine maintenance of the Alaska Highway west of the B.C./Yukon Border (Mile 626) and of the Haines Road was carried out by the Government of the Yukon Territory under agreement with the Federal Government. Greater emphasis was placed on the application of calcium chloride as a dust palliative with good results. The standard of maintenance throughout the year was good; a moderate spring breakup period was experienced and there were no major washouts or slides. Three contracts were awarded by Yukon Territorial Government for gravel crushing and one contract was awarded for crushing and surfacing. The maintenance of the B.C. Section of the Alaska Highway (Mile 83 — 626) was supervised directly by Departmental personnel through three highway maintenance contracts and two gravel crushing and surfacing contracts. All work was satisfactorily completed and a good standard of maintenance was achieved throughout the year.

Under the bridge replacement and strengthening program, the Beaver River Bridge (Mile 206.7) was replaced with a large diameter culvert. Progress on the replacement of the Bougie Creek Bridge (Mile 229) was disappointing and construction of the deck was carried over to 1974/75. The phased construction of the new bridge across the Muskwa River (Mile 297) proceeded very well with the completion of the sub-structure well ahead of schedule along with the construction of the immediate approaches and the award of the contract for the superstructure. The modifications to the Upper Liard Bridge (Mile 642.8) were completed. The replacement of the deck on Big Creek Bridge (Mile 674) was completed. Strengthening of the Teslin River Bridge (Mile 836.3) and replacing of the guiderail was satisfactorily completed. The modifications to the Yukon River Bridge (Mile 897.5), increasing both the strength and clearance, were completed but the painting was carried over to 1974/75.

Under the approved program for the reconstruction and paving of the Alaska

Highway within settled areas, the highway from Mile 83 to Mile 93 was reconstructed and the asphalt stabilized base course laid. The final pavement will be completed in 1974-75.

Under the program to improve sub-standard sections of the Alaska Highway, work continued on the two-year contract for the reconstruction of Mile 206 to Mile 229. The subgrade and sub-base course are virtually completed. A ditching contract was awarded and work completed for peripheral drainage along with the new alignment from Mile 257 to Mile 275.

The Department continued to provide engineering services to the Department of Indian and Northern Affairs in support of their northern roads program. During 1972/73 the construction of the Dempster Highway from Mile 166 to Mile 178 was completed and a contract awarded for construction from Mile 178 to Mile 237. In spite of the late start on this contract, the contractor was able to rough grade approximately 14 miles of road. After a shutdown for three months during the winter, the contractor started work again in early March. A contract was tendered and awarded for construction of the Carcross-Skagway Road from Mile 50 to Mile 66. Construction during the year was limited to clearing of the right-of-way. Twelve miles will be cleared by the end of the fiscal year.

#### Highway Plans for 1974-75

The maintenance of the Alaska Highway and Haines Road will be carried out under the same arrangements as in the previous year.

Under the bridge improvement program it is anticipated that the superstructure on the Muska River Bridge will be completed and the contract tendered and awarded for the deck. The outstanding work on the Bougie Creek Bridge and the Yukon River Bridge will be completed. The Silver Creek Bridge (Mile 1,053.6) will be replaced with twin, multi-plate culverts. The engineering assessment and design for the strengthening and deck renewal of the Lower Liard Bridge (Mile 459.8) will be completed. A final decision on the scope of this project will be made upon receipt and review of this assessment. The engineering evaluation and designs for strengthening and/or replacing existing bridges at various locations along the highway will be continued.

The final pavement of the highway from Mile 83 to Mile 93 will be completed as will the stabilized base course on the contract

from Mile 206 to Mile 230. The final design has been completed for reconstruction of the highway from Mile 230 to Mile 299. Preliminary engineering design for the reconstruction of the highway from Mile 93 to Mile 206 will be continued.

On the Dempster Highway the Department will supervise the construction of the contract awarded in 1973 for the construction from Mile 178 to Mile 237 on behalf of the Department of Indian and Northern Affairs. Planning is under way for construction of the Eagle River Bridge at Mile 237 under a contract with the Department of National Defence.

Work on the Carcross-Skagway Road will consist of the continuation of the construction from Mile 50 to Mile 66 with completion anticipated in late fall. An environmental impact study will be undertaken and the design finalized for the construction of the highway from Mile 66 to Mile 85.5. The design for the structures crossing the Upper and Lower Tutshi River and the White Pass and Yukon Railway track will be undertaken.

#### **1973-74 Property Administration — (Yukon District)**

The role of property administration in the Yukon District has continued and expanded to meet the ever-increasing demands for office, warehouse and Northern Pool Housing requirements for other government departments, Crown Agencies and the Yukon Territorial Government.

In Whitehorse several major renovations and office upgrading projects were completed in Crown-owned buildings to meet and satisfy the needs of various client departments. To further supplement the increased demand for office accommodation, Property Administration has leased office space in several buildings in the private sector.

The upgrading and preventive maintenance programs for the Northern Pool Housing were continued in Whitehorse and Fort Nelson. The demand for pool housing has increased resulting in a vacancy factor of less than two per cent.

#### **Property Administration Plans 1974-75**

Renovations are currently underway in Building 201 (Mess Hall) in the Takhini area and will be occupied by the Department of Public Works for office accommodation within the next few months.

As soon as Public Works vacate the Headquarters Building (Bldg. 200), extensive

renovations will proceed and the entire building will be occupied by Department of Indian and Northern Affairs.

Property Administration will continue to maintain Crown-owned buildings and northern pool housing as well as providing office accommodation for other government departments.



**ELDORADO NUCLEAR LIMITED (ENL)****Responsibilities**

To operate a uranium mine in the Beaver-lodge area of northern Saskatchewan and to engage in such exploration activity as the Company may see fit.

**Long-term Plans**

To continue the above with regard to available uranium markets.

**Review of 1973-74 Operations**

Under the operating policy adopted in 1969, the production of uranium in 1973 was maintained at approximately 70 per cent of capability. The number of employees at year-end stood at 385, of whom 279 resided in Uranium City.

**Plans for 1974-75**

Continuing operations at the same level as 1973.

## GOVERNMENT OF THE NORTHWEST TERRITORIES

### Responsibilities

To exercise government jurisdiction with the Northwest Territories, exclusive of control over natural resources (except game which is a territorial resource).

### Long-term Plans

To develop the Northwest Territories through legislation and administration geared to the special social and economic needs of the Northwest Territories and to involve all northern residents in the processes of governmental, economic and social development.

### Review 1973-74 Operations

Of major importance during the 1973-1974 fiscal year was the approval by Parliament in April 1974 of amendments to the Northwest Territories Act, which will have major significance to political development in the Northwest Territories. The amendments call for the establishment of a seven-member, fully-elected territorial council and elimination of appointed members to council. The Minister of Indian Affairs and Northern Development subsequently announced that when the fully-elected council was instituted he would propose a system whereby two council members would become members of the Executive Committee of the Government of the Northwest Territories.

In the area of education a major development was the publication of a junior high school curriculum handbook, which follows the footsteps of the elementary school curriculum handbook issued in 1971. The handbook is the first multi-cultural curriculum for young people who are entering their tenth, eighth or ninth year of education.

In September 1973, the Northwest Territories Housing Corporation commenced operations and the responsibility for all territorial administered housing programs, except Northwest Territories government staff housing, was assigned to the corporation. Major efforts are underway to alleviate housing problems in the Northwest Territories.

After a thorough study the Department of Industry and Development was restructured to respond more effectively to growing economic demands and was renamed the Department of Economic Development.

There has been a steadily increasing emphasis placed on alcohol education. The budget devoted to this area of concern has been substantially increased and more work is being done through grants to native organizations such as The Indian Brotherhood of the Northwest Territories and the Métis Association of the Northwest Territories.

The growth in local government has been steady and orderly and there are now a total of fourteen incorporated municipalities in the Northwest Territories, including hamlets, villages, towns and the one city, Yellowknife.

In all departments of the territorial government, attention is being given to economic and social changes that are bound to occur if a pipeline is constructed in the Mackenzie corridor.

### Review of Council Operations 1973-1974

On January 19, 1973, the 48th Council of the Northwest Territories convened at Yellowknife with a special tribute being paid to the R.C.M.P. centennial.

A budget of \$120.3 million was approved.

Legislation passed included the Registered Nurses Ordinance, The Certified Nursing Assistants Ordinance, Criminal Injuries Compensation Ordinance, the Loan Authorization Ordinance, a Corrections Ordinance and a Council Retiring Allowance Ordinance.

A number of amendments primarily to overcome minor deficiencies or to up-date existing ordinances were also enacted.

Recommendations concerning improvements to all aspects of the education program, means to develop a policy to provide preference to northern entrepreneurs tendering on government contracts, provisional support for the establishment of a Mackenzie Valley pipeline corridor, proposed establishment of a task force to undertake investigation of problems of unemployment and poverty; these and many other matters were referred to the administration for consideration before council was prorogued on February 12, 1973.

In June 1973, the 49th Council of the Northwest Territories adopted a comprehensive revised water and sanitation policy and the report of the Board of Inquiry into Labour Standards and Labour Relations. In line with the Board's recommendations the Labour Standards Ordinance was amended to increase the existing minimum wage.

Two separate task forces were proposed to enquire into all aspects of northern transportation and communication.

Also passed at this session were revisions to the Financial Administration Ordinance and the Seizures Ordinance, a Supplementary Appropriations Ordinance and amendments to the Snowmobile Ordinance.

Policy papers relating to the establishment of a Territorial Museum Program, the Trappers' Assistance Program, the establishment of a Territorial Parks System and the

preparation of Dower and Curtesy legislation were all approved before council prorogued on June 22 after sitting for ten days.

The opening of the 50th session of the Council of the Northwest Territories on October 15, 1973, marked the first time in the history of the council that girl pages were employed.

For the first few days council energies were directed to an exhaustive study of a policy paper setting out the principal concepts to be contained in a new Education Ordinance.

Of almost equal importance was council's endorsement of a report entitled "Observations and Recommendations Respecting Alcohol and Drugs in the N.W.T.", prepared by W.J. Wacko.

Additional legislation included the passage of the Territorial Parks Ordinance, the Environmental Protection Ordinance, amendments to the Dental Profession Ordinance and a loan authorization for the provision of funds to the City of Yellowknife for the construction of a municipal garage and for the construction of a housing project in Yellowknife.

Motions concerning the establishment of a day-care centre program throughout the territories were adopted by council and accepted as advice by the Administration.

The session prorogued on Friday, October 19, the fifth day of sitting.

The largest budget in the history of the N.W.T., \$150 million, came before the council when it opened its 51st session on January 19, 1974.

Noteworthy over the three-week session was the establishment of a tobacco tax, eight cents per 25 cigarettes and one to nine cents on cigars, depending on price.

A motion was passed to award a contract for the Hay River-Enterprise portion of the Mackenzie Highway. Council also directed the N.W.T. Government to begin drafting a new workers' compensation ordinance.

A recommendation calling for the establishment of a musk-oxen ranch in the N.W.T. was accepted by council.

Approval was given to the motion calling on the administration to look into the feasibility of establishing an N.W.T. ombudsman. Council also asked the government to expand the interpreter-translator corps by six members and a motion was approved supporting nurses in the Northwest Territories in their bid for higher wages.

A motion was passed for the administration to develop a separate branch in the government to manage adult education.

Council approved amendments to the labour standards ordinance lowering the work week and increasing the minimum wages in the territories, and approved a motion seeking an extension to the hunting season for migratory birds.

A motion was approved calling for the Department of Administration to look into the agricultural business.

Several other motions were passed before council prorogued on February 8, 1974.

On March 27, 1974 the Council of the Northwest Territories met in a special session in Yellowknife to discuss amendments to the N.W.T. Act introduced in the House of Commons.

As a result two representatives were chosen to appear before the standing committee on Indian Affairs and Northern Development to express views of the council.

Council endorsed provisions that all members of council be elected, that there be 15 elected councillors, that a speaker be appointed and that the office of deputy commissioner be part of the administration. Council also supported a separate bill which would provide one senator for each of the territories.

## **Department of Local Government**

### **Responsibilities**

Fostering, encouraging and assisting in the development of local government; administration of the municipal and hamlet ordinances; town planning and lands; recreation; civil emergency planning; public library services and coordination of employment for northern residents.

## **Review of 1973-1974 Operations**

### *Research Development Division*

In September 1973, the Development Division became the Research and Development Division.

A major research project reflecting the growing awareness and concern of all Canadians in matters of pollution control, environmental management and health standards led to the preparation of a policy for the provision of water and sanitation services in the Northwest Territories.

Extensive research was conducted on the development of community profiles aimed at producing a working analysis of the political, economic and social dynamics in the communities studied.

### *Training*

Training programs focused primarily on the areas of settlement secretary training, settlement council conferences and staff training, as well as diversifying the VTR program initiated in 1973.

### *Municipal Division*

In 1973 the Municipal Affairs Division became the Municipal Division with the added responsibility of supervising capital projects for the department and overseeing the expenditure of settlement budgets.

Scarcity of serviced land necessitated the development of new residential subdivisions, trailer parks and commercial areas. Road paving, sidewalk construction, street lighting, water and sewer extensions and expanded fire and police protection services continued.

Amendments to the municipal ordinance particularly in methods of assessing pipelining and ancillary equipment were approved by council in 1973 and new legislation passed for the assessment and taxation of mobile homes occasioned considerable interest in other parts of Canada.

On January 1, 1973, Fort Simpson and Pine Point were declared fully incorporated villages with full power to assume authority prescribed in the Municipal Ordinance.

### *Town Planning and Lands Division*

In 1973 there was a significant increase in the volume of work related to legal surveying, aerial photography and general lands business, including issuance of leases and sales, which were up 30 percent over 1972.

The Municipal Lands Policy has been published and distributed and a policy has been developed to administer Commissioner's lands outside Yellowknife's municipal boundary. A land pricing policy is being studied which will result in the pricing of a Commissioner's lands on an equitable and consistent basis.

### *Employment Division*

The division's resources and energies have been focused mainly on training-on-the-job programs, relocation programs and pilot labour pools. They have been seeking ways to increase the participation rate of northern people in the public service so that persons will be more representative of the communities served.

In addition, the Employment Division is the agency responsible for maintaining a closer liaison with Canada Manpower at policy, planning and operational levels.



### Public Library Service

One of the highlights in the 1973 public library services was the continuation of visits by the children's librarian in the Mackenzie region. Book circulation figures in 1973 for the first time exceeded the 100,000 mark reaching about 105,000. The number of library service points increased to 24 and it appears that use of library service by construction camps might become a significant figure. Statistics for the fiscal year 1972-1973 record a total of 1,940 special requests; an increase of 48 per cent over 1971-1972, and 28 per cent over 1970-1971.

### Emergency Measures Division

In addition to the continuing development of emergency plans for Northwest Territories communities to be implemented during periods of crisis, the division was given the responsibility for oil spill reporting and clean-up.

The forest fire season in 1973 was the worst ever, totalling nearly 500 fires and destroying more than 2 million acres.

The division represented the Northwest Territories in the international NATO exercise "Winter 73". In order that resources may be quickly and efficiently mobilized, a close liaison is maintained with Northern Regional Headquarters of the Canadian Armed Forces.

### Recreation

Canada Summer Games, Arctic Winter Games, Northern Games, Top of the World Ski Championship, Dog Derby and Toonik were events conducted during the year.

## DEPARTMENT OF EDUCATION

### Responsibilities

Curriculum, school services, adult education, vocational programs.

### Review of 1973-1974 Operations

A major step in 1973 towards developing curriculum appropriate to the social and cultural environment of the North was the publication of a junior high school curriculum handbook, "Learning in the Middle Years".

Other significant changes during the year include an expanded and improved program for native classroom assistants and major changes in the Teacher Education Program. The survey of education completed last year

was reviewed by council and after a detailed study by a special committee of council, legislation was prepared to revise the Northwest Territories School Ordinance and regulations.

### Enrolments and Teaching Staff

In September 1973, a total of 11,992 pupils; 4,600 Eskimo, 1,768 Indian and 5,624 others, were attending schools in the Northwest Territories. This is an increase of 200 over the previous year. The average increase over the past five years has been 7.3 per cent. Keeping in line with the increased enrolment, construction began on new schools and additions to several older schools.

In September 1973, 570 teachers were employed in the schools operated directly by the Government of the Northwest Territories. There were also 91 teachers employed by the three locally operated schools. This number represents a 5.7 per cent increase in the territorial teaching force over the previous year.

In September, 1973, a teacher education program began operating in Fort Smith and Chesterfield Inlet. An important criterion for entrance into this program is the ability of the student to be able to speak and write Athabaskan Indian language or Eskimo. Emphasis will be placed on the practice teaching aspect of the program and each student will spend his internship in his home community. It is expected that 20 student teachers will complete the two-year program and be issued with Northwest Territories Teacher's Certification.

Also during 1973 there were significant changes in the Classroom Assistants Program which employs young northerners in classrooms having Eskimo and Indian students. Most noteworthy was the establishment of two-year term positions for the classroom assistants, which gave them a considerable salary increase as well as most of the personnel benefits received by other public servants. Commencing September 1973, 101 native northerners were employed in the schools as classroom assistants.

The recently published curriculum handbook, "Learning In The Middle Years", provides the philosophy, methodology and learning activities for young people between ages of 12 to 15. The handbook prepared by interested participants all over the north is the first multi-cultural curriculum for people who are entering their seventh, eighth, or ninth year of education.

### Continuing and Special Education

There are currently 49 active programs which include apprenticeship programs, training in literacy, home management, living in a changing environment and occupational skills required to participate in a wage earning economy. There are also programs to assist those who wish to live off the land by means of trapping, mineral identification and guiding. A total of 1,389 people took advantage of the many adult education programs.

The Adult Vocational Training Centre at Fort Smith now offers full-time courses in 13 major skills. As of October 1973, there was a total of 150 trainees taking part in a great variety of vocational programs.

In 1973 the Certified Nursing Assistants course became a part of the National Testing Service and the Territorial Government now issues its own certificate under an N.W.T. Ordinance.

During the school year of 1973-1974 a total of 161 students received financial assistance under the Northwest Territories Students Grant Program. Another 10 independent students received bursaries of up to \$1,500 each to attend under-graduate or post-graduate training.

## DEPARTMENT OF SOCIAL DEVELOPMENT

### Responsibilities

Social assistance, blindness and disability allowances, child welfare, medical-social services and rehabilitation, corrections, alcohol education and the Health Care Plan.

### Review of 1973-1974 Operations

#### Social Assistance

Expenditures have continued their upward trend reflecting an increased urbanization of people who used to spend parts of each year "on the land". They now compete with the increasing labour force (it is estimated that approximately 2,000 young people enter the labour force each year) for relatively few year-round positions in each settlement. It must also be recognized that the population in the territories is increasing at between five to six per cent per year.

#### Child Welfare Services

The integration of juvenile delinquent and child welfare services undertaken last year has proven successful and good use is being made of the Fort Smith Centre, (formerly the Juvenile Training Centre) as a

short-term inter-regional children's treatment facility. A closer relationship is developing between child welfare services and such preventive and supportive programs as day care, homemaking, family life education and broad mental health program development.

#### *Alcohol Education*

"Alcohol In My Land", a film produced by the hamlet council and the people of Frobisher Bay and the "Captain Al Cohol" comic book series produced by the Department of Information and the Alcohol Education Program are both good examples of the increasing involvement in the prevention of the misuse of alcohol.

The majority of programs which received grants from a total available Community Alcohol Program fund of \$100,000 concerned themselves with the prevention and treatment of alcohol problems.

In preparation for the presentation of a major policy paper to council on the handling of alcohol and drug problems, Mr. W.J. Wacko was contracted to consult with groups and individuals across the territories. The resulting report has stimulated considerable support for concentrated action.

#### *Correction Services*

The effectiveness of decentralizing services in the field is under study. Authority has been obtained to open the first such service in the Baffin Region at Frobisher Bay, and plans were to begin operations by December 31, 1973. In addition to the objective of providing better correctional services at the level of the offender's home community, the Baffin Region services will serve to further the study and determine its feasibility in other regions.

The major objectives of these changes are to involve the community in the treatment of the offender, and to bring home to him the futility of unacceptable behaviour by placing him in a position where he pays his debt to society within the boundaries of his community. One additional benefit is that of the sentenced person maintaining daily contact with family, friends and employers.

#### *Territorial Hospital Insurance Services*

Guidance and executive authority for the administration of the Territorial Hospital Insurance Services ordinance is provided by the Territorial Hospital Insurance Services Board. Medical advice for both ordinances is provided by a medical adviser who is

employed by the administration to adjudicate disputes over length of stay in hospitals and the propriety of charges for physicians' services.

In 1972 the total number of patient days paid by T.H.I.S. continued to increase. A 14 per cent increase over 1971 was experienced, compared to a nine per cent increase the previous year.

### **DEPARTMENT OF ECONOMIC DEVELOPMENT**

#### **Responsibilities**

Promoting and assisting economic development, tourism, research and planning and game management.

#### **Review of 1973-1974 Operations**

During 1973 the Department of Industry and Development was renamed the "Department of Economic Development" to coincide with the dual economy of the Northwest Territories.

#### *Research and Planning*

The research and planning section now incorporates the research function which was part of the Division of Tourism.

Initial emphasis is being given to studies needed to ensure that maximum economic benefits are derived from oil and gas, pipeline and highway developments in the Mackenzie Valley.

This section has also co-ordinated Territorial Government planning and input in connection with a proposed mining development and new town near Arctic Bay on Baffin Island.

#### *Tourism Division*

In 1973 an estimated 23,000 tourists entered the Northwest Territories approximately half of them from the United States. This generated more than \$6,000,000 as well as contributing to additional employment opportunities.

Fifty-five per cent of the tourists entered by road, the balance by air. Fishing and hunting lodges attracted 50 per cent of those arriving by air while another 20 per cent of the air tourists were participants in inclusive tours visiting communities, mostly Great Slave and Mackenzie Valley communities.

The distribution of promotional literature almost doubled over 1972. The number of written enquiries answered during 1973 was approximately 25,000.

A new study began in 1973 involving a detailed investigation of the demand and supply factor relating to public accommodation in the N.W.T. Another smaller study is being undertaken to ascertain why so few territorial residents take their vacations within the Northwest Territories.

#### *Industry and Commerce Division*

The division of industry and commerce continued operation of three grocery stores in the Fort Smith region with sales amounting to \$130,000.

In February 1973, the Farmers Association became incorporated. Research is currently being carried out with respect to commercial production of fresh vegetables.

Sawmills of N.W.T. Grade Stamping Agency members are not only continuing to increase production but also the quality of the finished product. For the first time all member mills produced dressed, graded lumber competitive with southern mills. It is estimated that the production of lumber for 1973-1974 will be in excess of 5,000,000 f.b.m.

1973 saw the completion of the fibre glass water tank factory in Fort Providence. A total of 1,815 fibre glass water tanks were produced and installed in quarters in 46 communities. It is hoped that in the future the plant will manufacture for private sectors and government.

#### *Arts and Crafts*

In 1973 the Spence Bay Carving and Baker Lake Drawing projects were turned over to the Eskimo people in those settlements.

Canadian Arctic Producer Limited increased their sales during 1973 to an estimated \$2,000,000. This results in an estimated return to the settlement of \$1,400,000.

Handicraft sales have increased considerably with many exhibits being displayed throughout Canada.

As a result of a 1972 Spence Bay workshop a handicraft project, one using lichen and mosses for dying, was market tested and won acclaim wherever shown. In 1973 a series of workshops was held and the project began production in November 1973.

#### *Financial Assistance*

Assistance to Northwest Territories residents to establish businesses, or to meet capital costs to further their income from their chosen career has resulted in over \$2,500,000 in financial assistance being



under the three direct programs as follows. Number of loans processed to date are also shown.

N.W.T. Small business loan fund	63
N.W.T. Eskimo loan fund	85
Great Slave Lake Fishermen's loan fund	95

In addition, an estimated \$1,000,000 has been applied for under the Indian Economic Development Fund.

#### *Fisheries*

In 1973 continuing major fisheries were carried out on Great Slave Lake (2,609,229 pounds); on inland lakes near Great Slave Lake (250,581 pounds) and in the Cambridge Bay area (90,000 pounds). The total commercial fisheries production was 2,50,810 pounds at a landed value of \$1,105,420.

The administration of the Northwest Territories sport fishery was transferred to the Northwest Territories Government by the Federal Government. All licensing will be the responsibility of the Game Management Division.

#### *Cooperative Development*

Much of the emphasis of cooperative development was directed toward the laying of a firm foundation on which to build an ongoing credit union development program within the Northwest Territories. The Yellowknife Savings and Credit Union changed its name to the "North of 60 Savings and Credit Union" and has broadened its membership to include members on a territorial wide basis. This credit union, together with the N.W.T. Teachers' Savings and Credit Union, formed the N.W.T. Credit Union in March, with headquarters in Yellowknife. It is intended that this combined operation will be used as a management training facility for potential indigenous credit union managers. An operating grant of \$40,000 has been made to the Credit Union Central to assist them to become established and operational.

Four new cooperatives were incorporated during the year bringing the total number of cooperatives in the territories to 44 of which are "active". At least three other development groups have indicated a desire to incorporate and it is anticipated that they will become cooperatives during the coming year.

Studies are currently underway to determine to what extent Central Mortgage and Housing funds can be utilized by housing cooperatives in the Northwest Territories to

provide housing for low and middle income families.

#### *Game Management Division*

All applications for land use activities by exploration companies and proposed highway/pipeline developments are being reviewed with consideration of wildlife and the hunters and trappers relying on wildlife resources. Emphasis continues to be placed on the barren ground caribou because of the great significance of this species to the native people. Regulations permitting the sale of caribou meat by native hunters increased the revenue from this source to \$57,500. In addition, assistance was provided for organized caribou hunts in 16 settlements throughout the Northwest Territories harvesting approximately 160,000 pounds of meat valued at \$120,000. The big game outfitting camps continued to provide significant employment and revenue to the economy.

The overall value of fur production in 1973-1974 was about equal to last year despite a market reduction in the take of many species. The greatest decline was with white fox and muskrat. Local polar bear prices continue to climb. Twenty-eight hunters and trappers associations have been formed and it is expected they will take an active interest in the affairs of the people dependent on renewable resources. The Trapper Assistance Program continues to provide trappers with loans to purchase food and supplies at the beginning of the season.

Along with the continuing research on polar bears in 1973 a grizzly bear tagging program began to trace the movement of these animals. A two-year study on the food habits of the musk-oxen and caribou on Banks Island was completed in the late fall.

## **DEPARTMENT OF ADMINISTRATION**

### **Responsibilities**

Providing necessary support services for the other government departments in the areas of finance, personnel, supply, transportation, communication and data processing as well as managing the Consolidated Revenue fund, collecting all territorial revenues and performing related treasury activities.

## **Review of 1973-1974 Operations**

### *Systems and Computer Services*

The Systems and Computer Services Division developed and implemented many major applications during 1973 including a social assistance program, a housing program and a land inventory program. The growth in this area created the need for a larger and faster computer.

An IBM system, 370 series, was delivered in October to fill this need. In addition to providing greater efficiency, the new computer is capable of transmitting and receiving data from the regional offices.

The Division is continuing to train and employ native northerners in the Key punch and Computer Operations Sections.

### *Finance and Office Services*

The Finance and Office Services Division is responsible for all Territorial Government accounts, communication and central filing services.

A major study of government communication facilities in the Northwest Territories, with special emphasis on Yellowknife, was made in 1973. As a result of this study, the old telephone exchange for the government offices at Yellowknife will be replaced with a new system that has a larger capacity and a capability for new services.

### *Supply Services*

The Supply Services Division is responsible for the purchase, transportation and warehousing of materials and equipment for all departments of the Territorial Government.

The purchasing section provides the expertise at regional and headquarters levels for processing of requisitions for supplies.

During 1973 a computerized program was introduced for the acquisition, control and distribution of bulk petroleum products. Bulk products handled under the program include gasoline, which is now being sold to residents at a fraction of the former cost.

### *Personnel Services*

The Personnel Services Division is composed of four main sections: Recruitment and Placement, Pay Administration, Benefits and Subsidy Administration and Employee Accommodation.

A number of information pamphlets were developed for the benefit of the public and employees, and a consolidated information kit was prepared for new employees.

A new symbol was adopted by Personnel Services which appears on all employment



advertisements making them readily identifiable with the Northwest Territories.

A work experience program for commercial students, initiated in 1972, was a success again in 1973 with over 80 per cent of these students placed in employment at the end of the program.

Employment accommodation continued to present difficulties in 1973. Twenty-nine staff houses were constructed in various locations in the territories. In addition, a thirty-unit apartment block was constructed by the government in Yellowknife to help alleviate the housing shortage.

## DEPARTMENT OF PUBLIC SERVICES

### Responsibilities

To co-ordinate government services available to the public including court services, legal aid, vital statistics, licensing, fire and safety services, labour standards, workmen's compensation and administration of the Liquor Control System.

### Review of 1973-1974 Operations

#### *Legal Counsel*

The Legal Counsel Division provides legal services to the Territorial Executive and the several departments of the Territorial Government. These services include the preparation and perusal of contracts and other documents, legal advice, civil litigation and the enforcement of ordinances and regulations. The division also gives legal support to the Territorial court staff and to the various boards created under the authority of Territorial ordinances.

In addition, the division issues lottery and bingo licences, ensuring that the prizes advertised are actually awarded, and that the profits are used for the benefit of charities or the public.

#### *Legal Aid*

The Legal Aid Program for extending legal aid to persons who cannot afford legal services was instituted in August, 1971. The program is administered by a legal aid committee consisting of three persons: one representing the government as chairman, another the legal profession and the other a person who is neither a public servant nor a lawyer.

The Committee has recruited legal aid representatives who act on a voluntary basis. They maintain close contact with the Legal

Aid Committee, the Royal Canadian Mounted Police and other concerned persons and organizations and make themselves available at any time to interview persons who wish to apply for legal aid.

The Legal Aid Program has been most successful since its inception. It fulfils a long-standing need of persons without the necessary financial resources to obtain counsel to solve their legal problems. The government was not in a position prior to this program to extend any help except in serious criminal cases.

#### *Administration and Registries*

The administrative support to the Department of Public Services which includes budgeting, financial forecasts, requisitioning of supplies, co-ordination of personnel matters and the financial aspects of the court services and the R.C.M.P. agreement is now handled by an Administration Officer, leaving the Division Chief free to devote all his time to the Registries.

The Land Titles section assumed national notoriety with the reference by the Registrar to the Judge of the Supreme Court of the N.W.T. for a ruling as to the extent, right and interest of the Indian Chiefs of the N.W.T. to file a caveat on the untitled land in approximately one third of the land area of the N.W.T., using aboriginal rights as a basis of their claim.

The Securities registry continued to become better known, and the Registrar through his contacts with the Securities Commissions and Registrar of the provinces has been kept informed and aware of dubious securities schemes being attempted in other jurisdictions. The increased exploration and commercial activity in the Northwest Territories was reflected in an approximate 25 per cent increase in Land Titles and Document registrations with only a slightly smaller increase in the Companies and Securities registry.

The regulatory registries consist of vehicle registration, driver licensing, highway transport, insurance, business and professional licensing. The number of vehicles and drivers continues to increase steadily. It is planned that a nationally acceptable driver testing procedure and driver's licence will be implemented by 1975 to make a Northwest Territories driver's licence acceptable throughout Canada without the necessity of further testing.

The polar bear licence plate continued to be a popular collector's item and for the second year in a row was runner up in an

international competition to pick the most colourful, and original licence plate in Canada and the United States.

The operation of the weigh scale at Enterprise was assumed by the division in 1973. A highway transport inspector was employed to travel throughout the Northwest Territories checking commercial vehicles for weights, operating authority and licensing and school buses for safety.

#### *Highway Transport Board*

Among the policies developed or recommended by the Board was a restriction of intra-territorial authority to residents of the territories unless it is clear that territorial residents cannot provide the service in question or unless the applicant has established bases in the territories. Applicants are provided with copies of objections, by other carriers, to their application so that they may submit rebuttals to the Board or resolve the situation with the objecting carriers.

#### *Court Services*

The Department of Public Services provides support services for the judiciary which consists of the Supreme Court (One judge appointed by the Federal Government) and the Magistrates Court (Two Magistrates appointed by the Territorial Government). There are 13 judicial officers and members of the court staff all located in Yellowknife. Justice is dispensed in other parts of the territories by regular court circuits. Approximately 65 per cent of the criminal cases are processed through the dedicated efforts of lay justices of the peace located throughout the territories. The Territorial Government also appoints coroners who act under the authority of the Coroners Ordinance to investigate deaths by accident, violence or by any unexplained cause other than disease or sickness.

#### *Safety Division*

The Safety Division enforces and administers all fire and safety ordinances including inspections and investigations. This function also includes the enforcement of general safety practices, including the inspections and regulation of equipment such as electrical installations, fire safety hazards, oil, gas and propane installations and elevators. Public education and training is a necessary element in the administration of this program.

A training course was held in Yellowknife with participants from more than 25 settlements. Training courses were held in six

ther centres, covering 40 settlements. The courses are of three days duration covering fire-fighting techniques, inspections and corrections of hazards.

A total of 550 Boy Scouts were trained in courses in the use of dry-chemical fire extinguishers and Save-a-Life Program.

Grades 7 and 8 students of fifteen major schools were given the same course.

Electrical inspections were accelerated; over 300 permits were issued for new work with initial and final inspections. Over 200 existing buildings were inspected for electrical hazards. Numerous meetings were held with contractors and installers explaining the code requirements.

#### *Labour and Workmen's Compensation*

In 1968 a Labour Standards Officer was appointed to administer the Labour Standards Ordinance and other legislation of employer-employee content within a Labour Section. This original unit has since been expanded to include the responsibilities of enforcing the Workmen's Compensation Ordinance and has been appropriately renamed the Labour and Workmen's Compensation Division. During the ensuing six years, total payroll has increased by more than \$10,000,000, employers increased by 700, employees increased by one-third and work-related accidents doubled.

#### *Labour Standards*

The Labour Section conducted an increased number of on-site inspections at employers' business premises and investigated and resolved numerous complaints filed by employees regarding payment of wages, hours of work, etc.

The Labour Board of Inquiry, established in 1972, to advise the government on various labour matters, has now submitted a report. The Board recommended that a labour relations ordinance be established governing the relationship between employers and their employees. This ordinance is intended to guarantee to employees freedom of association, the right of collective bargaining and proper procedures for settlement of industrial disputes. Because of the situation which exists in the Northwest Territories where non-resident workmen are often employed on construction and other projects, certain provisions are to be included in the Ordinance to protect resident employees.

The Board recommended that: residents be exempted from payment of initiation fees

required by Union security clauses of collective agreements where the trade union is not a local trade union in the territories; seniority clauses be null and void with respect to resident employees; and in the case of health and welfare plans, contained in collective agreements, that they be so constituted that resident employees shall qualify.

#### *Workmen's Compensation*

In order to obtain a detailed view of the existing Workmen's Compensation Ordinance and a appraisal of the efficiency of its administration, the Commissioner, in May, 1972, appointed a Workmen's Compensation Board of Inquiry. The inquiry members have now presented recommendations which they consider will create an ordinance second to none in Canada in its scope and benefits.

Some of the 84 recommendations were: that the ordinance be renamed the Workers' Compensation Ordinance; an independent Workers' Compensation Board be appointed in the territories; the existing insurance system be retained; the ceiling on earnings be raised to \$10,000 from \$6,600; the compensation percentage remain at 75 percent; dependent widows' pensions be set at \$250.00 per month from \$110.00 per month.

#### *Liquor Control System*

The Liquor System is responsible for the importing, distribution and sale of liquor to the public and licensees within the territories. As well the system provides administrative support for the Liquor Licensing Board.

Sales in the fiscal year ending March 31, 1973, were up 15 per cent over that of the previous year, reaching the \$7,500,000 mark. It is estimated that this rate of increase will not be maintained in 1973 but will slow to a 10 per cent increase in the 1973-1974 fiscal year.

Extensions to the Inuvik and Frobisher Bay stores were completed in 1973.

The retail sales to the public through the Yellowknife store were turned over to a private company effective November 1, 1973.

The sales of liquor to the public are now provided through five government-operated liquor stores, four agencies retailing spirits, wine and beer, and two agencies retailing beer only.

#### *Liquor Licensing Board*

In the first eight months of 1973 the Board held 10 meetings and two public hearings.

Four new licences were granted, two applications were denied and one licence was suspended.

A petition for a local option plebiscite was received from the residents of Rankin Inlet.

### **DEPARTMENT OF INFORMATION**

#### **Responsibilities**

To provide a centralized service in English, Eskimo and Indian languages to interpret the government's aims and objectives to the public; production of a variety of government publications; operation of the government's central printing unit.

#### **Review of 1973-1974 Operations**

A major part of emphasis over the past year was the establishment of a nine-member Interpreter Corps within the Department's division of public relations and attempts to improve the transmission of information in the North.

The Interpreter Corps, unique in North America, is made up of Indian and Eskimo interpreter-translators who took a nine-month training course in Yellowknife before assignment to the regions in January 1974.

Members of the corps represent the Indian languages and the two main Eskimo dialects spoken in the Northwest Territories. The course was designed to give the interpreters a proper understanding of the operations of the Government of the Northwest Territories and the mechanisms of interpreting and translating.

In its attempts to improve the dissemination and two-way flow of information in the territories, the Department is continuing to negotiate for funding of its communications program that would place small radio broadcasting stations in the outlying communities. The program is designed to provide financial assistance to the community or hamlet council to purchase radio equipment.

Operation of radio stations would be the responsibility of the hamlet or community council, which would provide for operation and maintenance costs as well as staff to operate the station. It is presumed that the radio stations would be operated by volunteer labour initially and as activities



increased, the hamlet or settlement council would then hire a full-time employee for the station.

In line with this program, the department has established a radio program production centre at its Yellowknife headquarters. This centre will be used to provide programming material to the community stations upon request and to prepare government information-type programs to be sent to participating communities on a regular basis.

Newspapers are another essential communication tool in the Northwest Territories and to aid in the establishment and continued operation of such papers, the Department hopes to develop a community newspaper assistance program.

This program would be specifically designed for smaller centres in the North where advertising revenue is minimal and where local financial support is not large enough to sustain such an operation.

In Yellowknife, the Department's two newsletters, *Goinsiday* and *Tukisiviaksat*, were published on a regular monthly basis. These publications each have a circulation of 5,000 copies a month and contain information and pictures concerning developments in the North that affect the day-to-day lives of the N.W.T.'s 36,000 residents.

To assist in the production of its publications, and to fill the increasing demands of various agencies for good quality photographs of the territories the Department's photographic dark room was enlarged and refined for the processing and printing of colour photographs.

The photographic section also maintains some 5,000 slides, negatives and transparencies in a catalogued systems as well as co-ordinating the answering of written enquiries from the public for both general and specific types of information. These enquiries average about 500 per month during the school year.

In its attempts to develop new means of communication, the Department completed a four-part comic book series for the Alcohol Education Division, Department of Social Development.

The comics feature the alcoholic blunderings of Captain Al Cohol. The action takes place against an arctic background and the series is a deliberate attempt to illustrate the adverse effects of alcohol through the use of a novel and interesting medium.

The annual report in its hard-cover, full-colour format, is playing a valuable role in closing a communications gap between the

Northwest Territories and southern Canada, as well as other parts of the world. The publication is in the format of a "year book" reference book and is being collected in many private and institutional libraries.

"Arctic In Colour" magazine is finding an ever expanding market all over Canada and in the western region of the United States. The magazine is introducing the Arctic and its people to many readers for the first time. Newsstand circulation and subscriptions are growing at a rapid rate, indicative of the growing interest in the Canadian North.

The magazine has reached a point where it is economically feasible to negotiate with northern publishers on the possibility of a private entrepreneur taking over the publication. This is in line with the commitment of the Department of Information that it did not want to forever remain in the magazine publishing business but wanted to nurture the project until it was feasible for private enterprise to take it on.

The design section produced artwork for a variety of information pamphlets, brochures, programs, advertisements and speciality items. A symbol was designed for the N.W.T. Highways Division and is now in use on all Highways' vehicles, equipment, hard hats and uniforms.

During the year, the Department of Information offered its service to co-ordinate government advertising programs, aimed at better informing Northwest Territories residents of the services and programs available to them within the Northwest Territories Government. Work is now underway to make use of free time institutional public service type messages being offered by the Canadian Broadcasting Corporation on their Anik television service to the North.

## DEPARTMENT OF PUBLIC WORKS

### Responsibilities

To plan, buy or build and maintain and manage the government-owned physical plants in the territories, and working with federal government departments, to construct and maintain a highway system, as well as a network of settlement airstrips.

### Review of 1973-1974 Operations

During 1973 a major reorganization of the departmental headquarters was accomplished, in which a number of people were drawn in from the regional D.P.W. establishments in an effort to build a senior staff of

people having firsthand knowledge and experience. This reorganization also provided a re-definition of the planning, administrative and financial functions of the Department at headquarters and resulted in a substantially revised and re-staffed planning and administration division.

While many projects were successfully completed, the construction program suffered badly because of the late or non-delivery of material which is continent wide; however, the effects are much more severe in the territories than elsewhere.

It is necessary that the Department of Public Works be staffed by skilled and experienced tradesmen and professionals. Increased emphasis has been placed on the acquisition and development of departmental personnel.

### Planning and Administration Division

The division now provides services and gives direction to the operating divisions: regional D.P.W. offices while advising the director on certain matters.

An Industrial Relations Officer was added to the staff to provide personnel services: departmental staff, which on occasion exceeds one thousand.

### Highways Division

The Highways Division constructs and maintains the highways and byways of the North. In 1973 over 1,500 miles of trunk highways, secondary roads, winter roads, bridges and access and service roads serve the travelling public in the Northwest Territories. Five permanent highways maintenance camps have been established to carry out the maintenance program. In September 1973, some 30 miles of trunk highway south of Inuvik were taken over from the Federal Government for maintenance; the forerunner of the complete Mackenzie Highway which will link the Mackenzie Delta communities to southern Canada.

It is expected that the present 870 miles of trunk highways will be increased to over 2,600 miles by 1976.

### Operations and Maintenance Division

The Operations and Maintenance Division provides professional and technical assistance and direction to the regional D.P.W. establishments, and advises the Project Management Division on maintenance and operating matters related to new building and other projects.



The departmental reorganization saw a number of regional D.P.W. personnel transferred to the division in senior positions. Through their firsthand knowledge and experience, and a redefinition of its role, it is expected that the division will play a more direct part in the maintenance program in the field.

In recognition of the need for general grading of the quality of maintenance of government-owned heavy equipment, an office has been created to co-ordinate and direct this work. This office will also advise and assist other departments in the acquisition and operation of such equipment. An office has also been established in this division to administer the numerous rental and lease arrangements entered into by the government. This function is gradually being taken over from the Department of Administration.

#### *Project Management Division*

The Project Management Division is charged with the responsibility of carrying out the government's capital construction program, from conception to completion. Major educational projects in Frobisher Bay, Repulse, Cambridge Bay, Baker Lake and Fort Providence; housing programs including over 250 houses; and over 400 projects of various kinds bring the value of the 1973 program to over \$18 million. Of special significance are such projects as the establishment of a correctional hostel in Frobisher Bay; the several projects involved in the forthcoming move of Keewatin Regional Headquarters from Churchill to Rankin Inlet; and the proposed re-location of the Eskimo village at Resolute Bay, for which special teams of personnel and consultants have been formed.

Another area of great interest is the proposed up-grading of water and sewer services throughout the territories.

#### **EXECUTIVE SECRETARIAT**

##### **Responsibilities**

To provide administrative, policy and financial support to the Executive Committee and its individual members, to co-ordinate planning for Territorial Government programs and policies and for the analysis of existing programs and policies as directed by the Executive, and to administer the process of executive decision-making and communication, in an efficient and orderly manner.

#### **Review of 1973-1974 Operations**

##### *Audit Bureau*

The audit program was carried out in 1973 through the performance of audits within all activities of the Government of the Northwest Territories. Audits performed were consistent with the support of the Auditor General's staff as detailed in Section 67 of the Financial Administration Act.

As a direct result of audits performed; some corrective action has been taken and there have been general improvements in account procedures within housing associations, settlement councils and some departmental procedures, as they relate to Federal/Provincial agreements.

Under the amended Municipal Ordinance the Territorial Auditor has been appointed by all hamlets as auditor. These appointments are indications of the rapport developed over past years in working with the people to improve their systems, training and managerial capability.

##### *Financial Co-ordination and Program Analysis*

In the fall of 1971 the Territorial Government was first introduced to the P.P.B. (Planning, Programming and Budgeting) system. In brief, this concept relates objectives to planned expenditures by grouping into programs. The Government of the Northwest Territories has now accepted this new approach in program budgeting and is presently working on Phase 1 which is to revise all departmental objectives in light of total government objectives.

##### *Mackenzie Valley Pipeline and Highway Project Group*

The Territorial Government, over the past year, has been actively involved in the planning and implementation of projects related to development in the Mackenzie Valley. The co-ordination of the territorial involvement in this development is directed through the inter-departmental Mackenzie Valley Pipeline and Highway Committee. This committee is served by a project group which is responsible to co-ordinate the activities of the territorial program departments as they relate to the petroleum industry and to act as N.W.T. liaison between both the Federal Government and industry.

In an effort to provide long term employment to northern people, The Government of the Northwest Territories has established projects which are designed to expose northern people to the development in a manner

in which they can participate. One such project is the Hire North project which was established as a territorial program to clear the first section of the Mackenzie Highway extension to Inuvik employing northern people in a work environment in which they feel comfortable.

The Government of the Northwest Territories has taken on other jobs to be performed under Hire North in an effort to provide extended opportunities for northerners. These include such projects as construction of emergency shelters along the Fort Simpson-Fort Providence highway, and clean up along the total Northwest Territories highway system.

##### *Personnel Policy and Planning*

The formal review of the government's classification and salary administration plan scheduled from 1972 has been on-going and studies are expected to lead to collective bargaining and negotiations with the Public Service Association for implementation in 1974.

Territorial employees have been given 26 opportunities for educational development under the Education Leave Program in the 1973-1974 fiscal year. Increased emphasis on management seminars have been and will continue to be presented in both regional and headquarters locations. It is anticipated that these activities will be further expanded in 1974.

##### *Program Policy and Planning*

The Program Policy and Planning Division has undertaken or has been involved in several planning and research projects. Examples include: communication facilities in the Northwest Territories; the future of Apex Hill; new townsites at Resolute; Rankin Inlet District Service Office; Strathcona Sound project; schools financing; the use of videotape in Territorial Government programs; grants to communities; continuing and special education programs in the Northwest Territories; metric conversion in the Northwest Territories and outpost camps.

In the transportation field the division has had continued input into the use and evaluation of the Gulf Stream Aircraft which is leased by the Territorial Government to provide an east-west air link across the Northwest Territories.

1973 was an active year in the field of historical and archaeological resources. The division has responsibility for liaison with the Northwest Territories Historical Advisory Board and has been responsible for

the erection of an historical marker at Marble Island, Northwest Territories. A museum policy was developed and approved by the executive and by the Territorial Council during the year. This policy calls for the establishment of a museum in Yellowknife and for the development of extension programs to service community museums and historical societies throughout the Northwest Territories.

The division has provided support services and general research facilities to the Standing Committee on Development and Ecology of the Council of the Northwest Territories.

During the past two years the division has been involved in establishing a comprehensive bibliography of northern research materials, books and report. It is now in the process of establishing a central resource library to serve government departments, the Territorial Council and other interested persons.

## CLERK OF THE COUNCIL

### Responsibilities

To provide all necessary administrative and support services to council during sessions and to a large extent to the standing and special committees of council both during sessions and throughout the year.

### Review of 1973-1974 Operations

Early this year the Clerk of the Council was appointed secretary of the Commissioner's Award Committee and in this capacity provides the secretarial and administrative services required by that body.

This office undertook during the year, at the request of the Standing Committee on Rules and Procedure, a detailed comparative study of existing Rules of Provincial Legislatures and the production of an extensive draft revision of the Rules of Council. The draft revision after scrutiny and approval by the standing committee was presented to, and adopted by, council.

In the area of election matters, discussions and planning for the next territorial general election, which will be carried out in accordance with the provisions of the new Canada Elections Act, have begun. The term of office of the present council will expire in January 1975.

## GOVERNMENT OF THE YUKON TERRITORY

### ADMINISTRATION OF THE YUKON TERRITORY

#### Responsibilities

To administer the Yukon Territory in accordance with the Yukon Act and other federal laws applicable thereto, and the finances of the Yukon Territory.

### COUNCIL OF THE YUKON TERRITORY

#### Responsibilities

To exercise powers comparable to those of a provincial legislature.

#### Review of 1973-74 Operations

The Council had four sessions in 1973. The first session convened on February 14 dealt mainly with financial business. Other important legislation included the Fuel Tax Ordinance, Corrections Ordinances, Building Standards Ordinance and Amendments to the Labour Standards Ordinance. The session prorogued on March 6th.

The Second Session of Council, which began on June 13, 1973, was a special occasion for the Yukon Council, marked the Council's 75th Anniversary as well as the 75th Anniversary of the Yukon as a separate Territory. In honour of the occasion Council convened in Dawson City, Yukon's first capital. The Honourable Jean Chrétien, Minister of Indian Affairs and Northern Development, was present for Council's opening day.

The Third Session of Council was convened on July 23, 1973 for the purpose of continuing discussion of the Workmen's Compensation Ordinance and Workmen's Compensation Supplementary Benefits

Ordinance. The Bills were assented to and Council was prorogued on July 23, 1973.

A short session of Council was convened on September 27, 1973 to deal with the emergency repairs to the Robert Campbell Bridge. This session of Council also brought about a change in membership of the Executive Committee, retiring Councillor Norman S. Chamberlist and requesting that Councillor Clive Tanner be appointed to the vacancy.

Councillors met with the House of Commons Standing Committee on Indian Affairs and Northern Development on December 11 when the Committee was in Whitehorse for public hearings. Several Councillors presented briefs to the Committee concerning government in the Yukon Territory.

The Council is in the midst of the second Session for 1974. The First Session of Council, (convened February 13 and prorogued February 25), was held to clarify membership of the Advisory Committee on Finance. Elected Members of the Committee are: Councillors Tanner, Stutter and Watson.

In view of the amendments to the Yukon Act proposed in House of Commons Bill C-9, Council recessed on April 2, 1974 to allow Councillors Taylor and McKinnon to present consensus views of the Council and Bill C-9 to the Standing Committee on Finance in Ottawa. Councillors were successful in amending Bill C-9 to allow for expansion of Council up to 20 members without having to refer the matter to Commons.

It is anticipated that Council will have a short summer session to approve the report of the Electoral District Boundaries Commission, establishing 12 new territorial electoral districts. This would be the last session of the 22nd Wholly Elected Council.

#### Plans for 1974-75

The 23rd Council will have to deal with adjustments relating to its expansion from seven to 12 members.

### ADMINISTRATIVE SUPPORT SERVICES

#### Clerk of Council

As an officer of Council, the Clerk performs services comparable to those of a Clerk of a provincial legislative assembly. In addition the Clerk provides administrative support services to the Commissioner and to the Executive Committee.

#### Review of 1973-74 Operations

The Clerk of Council acted as an advisor to the Speaker and Members of Council and parliamentary matters during Council sessions. Throughout the year, the Clerk provided for the production and safe-keeping of the proceedings of Council and arranged for secretarial assistance for the Members of Council.

The Clerk and the Assistant Clerk continued to supply administrative support services required by the Executive Committee and its two sub-committees: Sub-Committee on Legislation and Sub-Committee on Finance. The Clerk of Council co-ordinated tours of the Territory for a number of visiting dignitaries, including: heads of diplomatic missions.

#### Plans for 1974-75

In 1974 the Clerk's office will be undergoing changes to accommodate the expansion of the Council. A program of review and consolidation of the Ordinances of the Territory is underway and will continue in 1974.



## **Federal Interdepartmental Co-ordinating Committee**

### *Secretary of Intergovernmental Affairs*

#### **Responsibilities**

This office was created in September 1973 to deal with matters of an inter-governmental nature. The primary function handled by the office is the Federal Advisory Committee on Northern Development and its sub-committees. In this regard the office provides secretariat and administrative support services to the Federal Interdepartmental Co-ordinating Committee, Whitehorse which is a sub-committee of the Advisory Committee on Northern Development.

#### **Review of 1973-74 Operations**

A constant review of the activities of the ACND was carried on throughout the year which included attendance at several meetings and the preparation of several papers and in-depth reports.

The Federal Interdepartmental Co-ordinating Committee which meets quarterly, held regular sessions in June, September, and December of 1973 and March of 1974.

In addition to the above-mentioned, the office also provides secretariat and support services to the Yukon Manpower Needs Committee.

#### **Plans for 1974-75**

The office plans to continue its involvement in the Advisory Committee on Northern Development and its Sub-Committees as well as the Yukon Manpower Needs Committee.

### *Statistical and Planning Adviser*

#### **Responsibilities**

Primarily responsible for maintaining a Statistical Unit within the Yukon Territorial Government to:

- establish stronger links and efficient communications channels with Statistics Canada and other external data-collecting agencies;
- conduct liaison with all federal and territorial data generators;
- develop an adequate data and information base and a central index file describing its contents so as to enable Territorial Government departments and other data users to extract desired information;

- conduct surveys jointly with Statistics Canada; and
- answer enquiries and requests for information on Yukon economy from businessmen, research students, etc.

#### **Activities 1973-74 Operations**

Development of a comprehensive compendium of statistics relating to all aspects of life in Yukon continued during the year. Communication with Statistics Canada was further strengthened with the recognition of this office as a statistical focal point and the extension of toll-free long distance telephone privileges to the Statistical and Planning Adviser.

In the spring of 1973, the Statistical and Planning Adviser assisted Statistics Canada in extending coverage under the Family Expenditure Survey to include Whitehorse.

#### **Plans for 1974-75**

- Publication of the existing compendium of statistics under the title of Yukon Statistical Review with establishment of arrangements to update the Review every quarter.
- Compilation of statistical profiles of individual Yukon communities on the basis of information available from the 1971 Census and other sources.

#### **Future Plans**

Participate in the planning and conduct of the 1976 Census in the Yukon Territory.

### *Land Claims Secretariat*

#### **Responsibilities**

To provide research and administrative services to the Commissioner and for the Government of the Yukon Territory on matters concerning Yukon Indian Land Claim Negotiations.

#### **Review of 1973-74 Operations**

The Secretariat was formed in June 1973 and has prepared information for Territorial positions given at three negotiating sessions held in Vancouver in July, October, and November and at two inter-governmental meetings. The staff employed during this time were a research administrator, research assistant / typist, legal researcher, draftsman, and anthropologist.

#### **Plans for 1974-75**

The Secretariat will continue to provide necessary research and administrative services for negotiating sessions and related activities through the year.

#### **Long-term Plans**

The Secretariat will maintain its activities as required for the duration of the Yukon Indian Land Claim Negotiations.

## **ADMINISTRATIVE AND LEGISLATIVE SUPPORT SERVICES**

### *Personnel Adviser*

#### **Responsibilities**

The Central Personnel Office is responsible for recruiting and selecting Civil Servants; job evaluation and pay administration; administering and interpreting the Collective Agreement; contract negotiations; staff establishment control and organization analysis; employee appraisal, safety, training and the administration of fringe benefit programs.

#### **Review of 1973-74 Operations**

A total of 1,736 permanent and casual appointments have been processed during the course of the fiscal year. A total of 43 permanent appointments were made to the government service, which included 383 civil service appointments and 54 teacher appointments. Of the 383 civil service appointments, 94.52 per cent were from residents of the Yukon Territory. The average turnover for the government service in total, including appointments to civil service positions, teaching positions and internal promotions (based on 907 civil service permanent positions and 256 teaching positions), was 37.58 per cent.

### *Job Evaluation and Pay Administration*

Approximately 166 position transactions and 38 classification and pay plan amendments were processed during the fiscal year. A number of class specifications were drafted and printed for distribution throughout the government service. During the course of the fiscal year a number of re-surveys were conducted, particularly the stores clerk and stockkeeper class series, liquor vendor and related classes of employment, including tourism and information officer classes of employment. A major re-survey was conducted of the secretariat

clerk-stenographer and clerk-typist classes of employment.

#### *Staff Development and Training*

Approximately 150 employees received some form of financial assistance in updating their skills through attending courses jointly sponsored by the Central Personnel Office and the departments. The courses included "Supervisory Training", "First Aid", "Superannuation", "Driver Training and Firebreak", "Accident Prevention", "Records Management", "Interviewing Techniques" and financial and related courses. A number of employees enrolled in night school and correspondence courses in shorthand, assessment, accounting and financial control.

#### *Staff Relations*

A two year Collective Agreement was negotiated with the Public Service Alliance of Canada, covering approximately 720 bargaining unit employees, effective 1 April, 1973 to 31 March 1975. During the early part of 1974 negotiations commenced with the Yukon Teachers' Association for a renewal of their agreement which expires on 1 August 1974. A number of amendments to the current Collective Agreement were agreed upon between the Alliance and the employer during the fiscal year, and several grievances were referred to the adjudicator, appointed by the Yukon Public Service Staff Relations Board.

#### *Other*

During the course of the fiscal year the Public Service Regulations were updated and the Central Personnel Office introduced personnel policies to cover those areas outside the scope of the collective agreement and the regulations pursuant to the Public Service Ordinance. Early in September 1973, a major study was completed on staff establishment control and organizational analysis. During the course of the year the Central Personnel Office, in conjunction with the Data Centre introduced a departmental staff establishment printout and a mass printout.

In an attempt to familiarize themselves with departmental operations and to assist in effectively communicating with employees outside the central headquarters area, personnel officers travelled to the majority of highway maintenance camps, located outside Whitehorse, including specific trips to Dawson City and Yukon House in Vancouver.

#### **Plans for 1974-75**

The Central Personnel Office will be negotiating with the Yukon Teachers' Association for the renewal of their agreement with the Government and, during the latter part of 1974, will commence negotiations with the Public Service Alliance of Canada to renew the existing collective agreement.

During the year, the Central Personnel Office will place emphasis on staff establishment control in relation to the estimating requirements of departments, place emphasis on continuing to offer courses in the Yukon by professional trainers, review the superannuation ordinance and internally review the administrative procedures with respect to fringe benefit programs and employee documentation procedures.

Emphasis will again be placed on effectively communicating with departments, and on ensuring that personnel officers and periodically visit regional offices outside the central headquarters area to clarify benefit programs, the interpretation and application of the provisions of the collective agreement, to answer enquiries and to generally review the effectiveness of personnel programs on regional operations.

### **DEPARTMENT OF EDUCATION**

#### **Responsibilities**

The Department of Education is basically responsible for the provision of elementary and secondary education for the children in the Yukon Territory in accordance with the provisions of school ordinance. In addition, the Vocational Branch within the Department is responsible for vocational, technical and apprenticeship training for adults throughout the Territory.

The Recreation Branch of the Department of Education is responsible for the development, initiation, and operation of fitness and recreation programs for people of all ages throughout the Territory.

#### **Review of 1973-74 Operations**

##### **Elementary and Secondary Schools**

In April 1973 the school population had declined to 4,668 students from a total figure of 4,815 in September 1972. The decline of 3.1 per cent in the school population during the first seven months of the 1972-73 school year was attributable to a number of factors, viz.

- i) the completion of programs by a number of students at the Grade 12 level at the end of the first semester;
- ii) the impending closure of the Wellgreen Mine at Quill Creek resulted in the withdrawal of numerous students from the schools at both Haines Junction and Destruction Bay; and finally,
- iii) the transfer of students to schools outside the Yukon and the normal "drop-out" of students at the secondary level to seek employment.

In September 1973, the school population was 4,815 — identical to the total enrolment in September 1972. By the end of March 1974 the school population had again declined by 1.5 per cent to 4,742. The decline was attributable to the factors noted in (i) and (iii) above.

A new junior-secondary school was opened in Whitehorse in September 1973 bringing to 23 the number of schools operated by the Department of Education. The teaching staff in the schools was minimally reduced from 258 during the 1972-73 school year to 255 during the current school year.

During the 1973-74 fiscal year, construction was completed on an addition to the Teslin school. The addition provides a gymnasium with performance stage, a library, a general science laboratory, an administrative office and two additional classrooms. Construction commenced on an addition to the Robert Service School in Dawson City during the summer of 1973 and it is anticipated that it will be completed by January 1975. The addition will include a gymnasium with ancillary facilities and two additional classrooms. Renovations to the present activity room will provide a library and an art room. Planning was completed for a new school at Ross River to replace the portable structure which has been utilized since 1967. Finally, planning was completed for the renovation of a teacherage in downtown Whitehorse to provide dormitory accommodation for female students.

The Department of Education continued its assistance programs relative to pre-school and post-secondary education. Grants totalling \$85,000 were provided to co-operative community kindergartens for the payment of instructors' salaries and for the purchase of supplies and equipment. A total of twenty-two kindergartens were operated throughout Yukon during 1973-74. Grants and bursaries totalling \$158,400 were



provided to 173 Yukon students attending post-secondary educational institutions outside the Territory. In addition, 31 certificates of eligibility for Canada Student Loans were issued.

A program of remedial instruction, funded by a grant from the Department of Manpower under its Local Employment Assistance Program, was initiated in selected schools throughout Yukon in September 1973. The program has proven to be of considerable value and it is anticipated that it will be continued, provided that funding is available through the Department of Manpower.

#### Plans for 1974-75

Construction of the new school at Ross River, the addition to the Robert Service School at Dawson City and the renovations to an existing teacherage for a dormitory in Whitehorse for female students will be completed. Planning for the provision of additional school facilities at Mayo will also be undertaken. Finally, careful consideration will be given to the need for alternate school accommodation in the Greater Whitehorse area.

A program of curriculum development has been initiated and will be continued throughout the current year. It is proposed initially to develop locally-oriented units or sample studies for inclusion in our Social Studies program. Plans will be formulated for the development of a supplementary reading series utilizing local materials, legends, etc. for the primary grades.

#### Long-term Plans

With the completion of the building program outlined previously, the need for additional physical facilities will have been met and emphasis will be placed on the development of local curricular materials particularly in relation to our Indian students.

#### *Recreation Branch*

##### Review of 1973-74 Operations

The past year saw an upswing in the number of leadership clinics throughout the Yukon, necessitated no doubt by Yukon involvement in Canada Summer and Arctic Winter Games.

Although the Yukoners did not set any new records, they did have the opportunity to participate.

Locally, more and more people are becoming involved in every type of leisure time activity.

Some twenty-five sports bodies and six cultural groups were active in 1973-74.

#### Plans for 1974-75

The major emphasis will be placed on the development, initiation and supervision of an ongoing physical education program in the schools from kindergarten through Grade 12 with special concern for total participation.

#### Long-term Plans

Continued supervision and development of the physical education program in the schools in addition to the development of a complete recreational program for people of all ages and interests in Yukon.

#### *Vocational, Technical and Apprenticeship Branch*

##### *Vocational Training*

Pre-employment training and academic upgrading is provided in Whitehorse at the Y.V.T.T.C. and in the outlying communities. Both full-time day and night courses are available.

#### Courses at the Yukon Vocational Technical Training Centre

##### *Regular Programs*

The Y.V.T.T.C. provides 15 different pre-employment courses on a regular basis each year. Eleven are 10 months long, three are five months long (offered twice a year), and one course is four months long, also offered twice a year. Four of the pre-employment courses are trades courses and on successful completion provide one year credit towards an apprenticeship. The welding course which is non-apprenticeable qualifies a person to test for a B.C. D.P.W.-3 welding ticket; three courses are commercial courses, and the Nursing Assistants course provides a C.N.A. certificate recognized in the provinces. The remaining courses of Arts and Crafts, Food Services, Drafting, Heavy Equipment Operators and Basic Mining qualify for certificates of training received.

Academic upgrading courses are offered to provide for four levels of requirements:

- 1) Basic literacy for people with a grade 0-4 level of education.
- 2) Basic education in mathematics and communication skills to a grade 10 level for people with a grade 5-9 level of

education. A program in lifeskills is offered in conjunction with the upgrading.

- 3) B.T.S.D. III — For those who require only a few months of upgrading to bring them to a grade 10 level in science, mathematics and communications. Continuous intake.
- 4) B.T.S.D. IV — For people with at least a grade 10 and who have not attended school for a number of years and who wish to acquire the necessary subjects for entry as a mature student to a technical school or university.

#### *Additional Short Courses*

Short courses ranging from one week to six weeks are provided in response to recognized need and/or requests from industries and organizations. Some of the courses offered in 1973 included Oil Burner Mechanics, Forest Fire Suppression, Logging and Outfitters Guide Helpers.

#### *Courses in the Communities*

The major emphasis in the communities on academic upgrading from illiteracy to the grade 10 level. Educational upgrading courses were provided in ten communities in 1973 with an enrolment of about 125 people. The instructors were local by training for six weeks and supervised by a trained educator.

A program of Home Education is available to wives and mothers in the communities which covers home care, nutrition and budgeting.

Two travelling instructors of ceramics and carvings have been travelling to various communities and providing instruction to children and adults.

A Basic Carpentry course was provided in Pelly Crossing and Carmacks.

#### *Project Work*

Emphasis is placed on practical training and as a result, a four bedroom house was constructed in Whitehorse by the Building Construction class and wired by the Electrical class. The house was sold by tender for \$37,650.

A number of houses were finished in Pelly and Carmacks and a Community Hall built in Pelly Crossing by the Basic Carpentry people.

The road to the Wolf Creek Correctional Institute was rebuilt by the H.E. Operators class and the re-construction of the road to the Takhini Hot Springs was begun.



## General

In the term year September 1972 to June 1973, a total of 38 courses were offered with a total enrolment of 657 people. In the term year of 1973-74, 455 people were enrolled in 33 courses to the end of December 1973.

## Night School

During the period of October 1973 to March 1974 a total of 889 trainees enrolled in night school classes, an increase of 235 or nearly 36 per cent over the previous night school season total of 654. Of the 889, 735 were in the Whitehorse area and 154 in Faro, Mayo and Elsa. Enrolment in vocational upgrading or employment oriented courses was 369 and 520 in the avocational or interest courses. The ratio of enrolment in the two categories changed very little from previous years.

## Industrial & Apprenticeship Training

Special courses are provided to meet specific needs of industry and labour. In most cases instructors are specialists from Alberta and British Columbia who have established reputations as competent instructors. A total of 144 trainees enrolled in the six courses listed.

### University of Alberta Management Certificate Program Course

No. 1 — Business Organization & Administration	50 hours	39 enrolled
No. 2 — Financial Accounting & Managerial Controls	50 hours	39 enrolled
Automotive Emissions Controls	5 days	10 enrolled
Supervisory Part		
No. 1 Foremanship	5 days	22 enrolled
Oil Burner Mechanic (Basic)	15 days	20 enrolled
Lumber Grader	30 hours	14 enrolled

This course was conducted at Watson Lake and 10 graduates qualified for "B" certificates and one received an "A" certificate from the Council of Forest Industries of British Columbia Quality Control Division.

Management and corporate changes at 10 major mining complexes resulted in the cancellation of 12 one-week courses affecting approximately 250 supervisors and tradesmen.

A survey was made to determine the interest in courses and seminars specifically

designed to meet the requirements of professional and para-professional people. Questionnaires were mailed to 200 members of the Chamber of Commerce, Yukon Mine Operators Association and others; and 51 replies were received.

## Apprenticeship Training

Thirty-one apprentices are indentured and indications are that more employers are planning to participate in the program. Corporate changes at two major complexes resulted in a delay in the implementation of the program at one, and the strong possibility that it will be introduced at the other. All apprentices attend compulsory annual technical training courses of four or eight weeks provided in British Columbia for B.C. and Yukon apprentices. Transportation, training (living) allowances and course costs are provided under an agreement with the Department of Manpower and Immigration.

## Tradesman Qualification

Examinations and certification procedures were completed for three additional trades increasing the total to ten which includes Automotive Mechanic, Heavy Equipment Mechanic, Carpenter, Industrial Electrician, Hairdresser (Cosmetologist), Plumbing, Steamfitting/Pipefitting, Industrial Mechanic, Construction Electrician, Auto-Body Mechanic. A total of 24 tradesmen qualified for certificates and one received the Interprovincial Standards Examination Red Seal endorsement. Examinations were held where and when requested.

Trade Qualification Examinations were reviewed and updated by the Trade Advisory Committees for the Heavy Equipment Mechanic (Motor Transport) Trade and Heavy Equipment Mechanic (Construction Equipment) Trade. Each examination was revised approximately 60 per cent.

## Rehabilitation

In August of 1973 a full time Co-ordinator of Rehabilitation Services was appointed. The Co-ordinator is responsible for the implementation of the Rehabilitation Services Ordinance and the Vocational Rehabilitation for Disabled Persons Agreement. This branch is currently assisting the physically and mentally disabled of the Yukon to acquire adequate skills to enter the labour market. Physical, psychological, social and vocational assessments are administered; programs of remediation and

restoration implemented; training programs initiated; and placement services offered.

From August 13, 1973, till December 31, 1973, a total of 39 referrals were received by this branch. Twenty-four of these referrals came from the Health, Social Welfare and Rehabilitation Directorate; five from the Education Directorate; six from the Workman's Compensation Board; and four were self-referrals. Of these individuals, 14 maintained or commenced training programs, nine maintained or commenced employment, five commenced or continued medical treatment, four were discontinued because of non-interest in Rehabilitation Services, and seven were awaiting service and carried into 1974.

## Plans for 1974

### Vocational Training

The academic upgrading courses in the outlying areas will be expanded to 12 communities. The program in a number of communities will be expanded to include Lifeskills. The Arts & Crafts courses in the Y.V.T.T.C. will be expanded to include Metalcraft. Efforts will continue in the direction of encouraging the development of a cottage industry in Arts & Crafts.

### Industrial & Apprenticeship Training

Continuation and expansion of courses for industries will include training in industry as well as on-site upgrading and supervisory courses.

It is anticipated that the apprenticeship program will continue to grow at an accelerated rate.

### Rehabilitation

In 1974 it is planned to assist in the development of a Sheltered Workshop Program within the Territory, to implement an on-the-job training program for the disadvantaged, with the Territorial Government departments, assist the Alcohol and Drug Addiction Directorate in the establishment of a comprehensive rehabilitation program, and generally enhance community awareness of the problems of the handicapped within the Territory.

## DEPARTMENT OF HEALTH, WELFARE AND REHABILITATION

### Corrections Branch

#### Responsibilities

To provide adult and juvenile probation services, and to supervise parolees and

probationers from federal and provincial institutions and jurisdictions.

To operate a juvenile facility for children awaiting juvenile court hearing and for male and female juveniles declared by the courts to be delinquent.

To operate a medium-security institution; arranging for the custody, care and treatment of persons who have appeared before Territorial courts and have been remanded or sentenced to terms of imprisonment of less than two years.

#### **Long-term Plans**

The continued use and extension of probation services with involvement by community groups, and the use of volunteer probation workers. With the co-operation of educators the schools should teach the correctional function to pupils, with a view to helping them understand their civic responsibilities.

It is hoped that the use of the planned juvenile training home as a comprehensive facility for boys and girls will take care of those who have not otherwise been diverted from the court system.

It is intended to maintain the medium security institution as a clearing house, admitting those inmates to day-release programs who are capable of entering. Outside activities will involve community projects and attempts will be made to instil work habits, self-confidence and self-discipline by means of leadership training in wilderness areas.

#### **Review of 1973-74 Operations**

During 1973 a total of 441 admissions was recorded at Whitehorse Correctional Institution, an increase of 69 over the previous year.

Males	264 sentenced 144 remanded
Females	27 sentenced 6 remanded

The probation work caseload continued to rise over the year. On March 31, 1974 the caseload was 353, compared to 277 on 31 March, 1973.

An Impaired Driver Training Program was started in March, 1974 by the Probation Branch in collaboration with the Alcohol Treatment Counsellor. Persons convicted under Section 234, 235 and 236 of the Criminal Code are liable to be made subject

to a probation order and required to attend a series of lectures, films and discussions. The program is based on that which has been initiated in Alberta and has been operating with considerable success over the past three years.

During the year the demand on the juvenile training home continued to be heavy with an average daily count of 27 children. The start of a new facility is eagerly anticipated in 1974-75.

#### **Plans for 1974-75**

It is planned to extend the pilot survival training course for young adults and male juvenile offenders to include youngsters placed on probation who may be in need of guidance. The terrain of the Yukon lends itself particularly to this type of venture and it is hoped that there will be positive results with this particularly difficult group of young people.

#### *Health Services Branch*

##### **Responsibilities**

##### **Yukon Hospital Insurance Services**

In-patient care for the acutely ill, where medically necessary, is provided at no cost to residents at any approved hospital in Canada. Payment by the Plan outside Canada may not exceed that per diem rate of an approved facility.

The plan also provides for the use of hospital facilities on an out-patient basis for the diagnosis and treatment of an injury, illness or disability together with any consultation which may be necessary.

##### **Yukon Health Care Insurance Plan**

Popularly referred to as "Medicare" the plan provides residents with insured medical services, without geographic restriction. As with hospital insurance, payments for individual services outside of Canada are limited to the amount which would be paid for the same or a similar service in the Territory.

##### **Long-term Plans**

Responsibility for the health care delivery system in the Territory is divided between the Government of the Yukon Territory and DNH&W. General health services — the area of DNH&W responsibility is being reorganized and expanded from "Zone" to "Region" status, the initial step towards assumption by YTG of responsibility for the complete health care delivery system.

Yukon Hospital Insurance Services is a well established program and no immediate change in the scope of benefits is foreseen. As the hospitals in the Territory cease to be operated by the federal government they will be converted to budget review operations.

A new fee schedule will come into effect on April 1, 1974 and changes to premium rates will also occur. Premium rates will be reduced by approximately 25% for all categories and will be eliminated entirely for persons aged 65 or over. No changes in the scope of benefits is planned in the immediate future for the Yukon Health Care Insurance Plan.

#### **Review of 1973-74 Operations**

##### **Yukon Hospital Insurance Services**

In May 1973 Clinton Creek Cottage Hospital commenced operations increasing the number of hospital beds to 154 but no changes were made in coverage or the benefits provided by the Plan.

Increases in the utilization of both in-patient and out-patient services were experienced ranging from 13.1 per cent in in-patient days to 18.6 per cent in out-patient services. The official population per DBS increased by 5.3 per cent from 19,000 to 20,000. The average length of stay changed fractionally but continues to be about 70 per cent of the national average and represents savings of some 10,000 to 11,000 patient days. The overall cost of the Plan rose substantially (41.2 per cent) reflecting not only the increase in utilization but also the rise in hospital operational costs.

##### **Yukon Health Care Insurance Plan**

Increases in all aspects of the operation of the Plan were expected but the per capita cost of insured services @ \$57.23 was some \$4 below estimate and approximately \$7 lower than the national per capita cost. The doctor/population ratio in the Territory (1:909) was further supplemented by regular visits of various specialists — ophthalmologist, etc. at intervals of three to four months.

#### *Social Welfare Branch*

##### **Responsibilities**

This Branch is responsible for the administration of a complete program of public welfare services. These services are provided within the framework of the

**Yukon Hospital Insurance Services**

<b>SERVICES</b>			
	<b>1973</b>	<b>1972</b>	<b>Increase (Decrease)</b>
<b>In-Patients</b>			
<i>Adults &amp; Children</i>			
Patient days	27,250	24,338	3,182
Separations	4,157	3,606	551
Average length of stay (days)	6.6	6.7	(.1)
<i>Newborn</i>			
Patient days	2,368	2,584	(216)
Separations	388	397	(9)
Average length of stay (days)	6.1	6.5	(.4)
<b>Out-Patients</b>			
Diagnostic	7,615	6,961	654
Accident	3,176	2,138	1,038
Accident third party	54	46	8
<b>TOTAL</b>	<b>10,845</b>	<b>9,145</b>	<b>1,700</b>
<b>COSTS</b>			
	<b>1973</b>	<b>1972</b>	<b>Increase (Decrease)</b>
In-Patient Services	\$1,712,563	\$1,206,037	\$506,526
Out-Patient Services	141,926	103,350	38,776
Administration	49,553	39,994	9,559
Third party recoveries	(5,251)	(4,492)	(759)
<b>TOTAL</b>	<b>\$1,898,791</b>	<b>\$1,344,899</b>	<b>\$553,892</b>
Per Capita Cost	94.94	70.78	24.16
<b>SERVICES</b>			
	<b>1973</b>	<b>1972</b>	<b>Increase (Decrease)</b>
<b>Territory</b>			
Number of Services	\$ 56,452	\$ 65,082	\$ 8,630
Cost	\$638,469	958,232	319,763
Cost per Service	11.30	14.72	3.42
<b>Rest of Territory</b>			
Number of Services	2,911	5,738	2,827
Cost	91,836	186,281	94,445
Cost per Service	31.54	32.46	.92
<b>Overall</b>			
Number of Services	59,363	70,820	
Cost	730,305	1,144,513	
Cost per Service	12.30	16.16	
<b>COSTS</b>			
	<b>1973</b>	<b>1972</b>	<b>Increase (Decrease)</b>
<b>Insured Services</b>			
Payments to practitioners	\$721,919	\$1,126,439	\$404,520
Reimbursement of residents	2,979	8,662	5,683
Payments to dentists	5,407	9,412	4,005
Total	\$730,305	\$1,144,513	\$414,208
Administration	50,409	81,254	30,845
<b>Grand Total</b>	<b>\$780,714</b>	<b>\$1,225,767</b>	<b>\$445,053</b>

Branch's statutory responsibilities as defined in the Social Assistance Ordinance, the Child Welfare Ordinance, the Blind Persons Allowance Ordinance and the Disabled Persons Allowance Ordinance and related regulations.

The major programs of Social Assistance and Family and Child Welfare encompass a broad range of social services and facilities which are essential supportive resources in the provision of an adequate social welfare program.

The Branch's program responsibilities also include the operation of the following geriatric and child care facilities:

*Whitehorse*

- Two senior citizens homes — maximum capacity 60 persons
- Children's Receiving Home/Assessment Centre — capacity 15
- Three Group Homes — capacity eight children each
- Home for Handicapped children — capacity eight

*Dawson City*

- Nursing Home/Senior Citizens Home Complex — capacity 25
- Children's Receiving Home — capacity eight

*Mayo*

- Children's Receiving Home — capacity eight

*Watson Lake*

- Children's Receiving Home — capacity eight

The operational headquarters of the Branch is located in Whitehorse and comprises the:

- General Administration Division
- Metro Whitehorse Services Division
- Adoption and Special Placements Division
- Field Services Division
- Homes and Institutions Division

Field offices are located in Dawson City, Mayo, Ross River and Watson Lake and provide services within specific geographic regions and thus ensure that all outlying areas are adequately serviced. Communities along the Alaska Highway three hundred miles north to the Alaska border, and one hundred miles south of Metro Whitehorse are serviced from Whitehorse by social workers who are specially assigned to cover the highway areas.



Long-term Plans

Planning will continue to be directed towards the development of sound social policies and positive social welfare programs. Development of services and necessary supportive resources will continue in the light of existing need and changing socio-economic conditions.

Review of 1973-74 Operations

During the year in review program activity remained fairly constant in comparison with the previous year's activity and caseload increases were kept to a minimum mainly because of the expansion of field services, improvements in program practices and a more intensive program of preventive services. Generally, a good deal of progress has been made in all areas of the Branch's

work and a high standard has been maintained in the delivery of services and in the administration of the social legislation for which the Branch is responsible.

The total caseload for all programs extended by the Branch was 2,732 cases representing services provided to 5,690 persons. In comparison with the 1972-73 fiscal year this represents a decrease of 36 cases but an increase of 542 recipients of services. This increase in the number of recipients in the caseload is related to the Family Service and the Child Protection programs where larger family groups received services.

Expenditure for welfare services, operation of homes and institutions, and administration of the Branch amounted to \$2,085,000, representing a per capita cost of \$104.25.

The caseload figures by category of service are shown below:

CATEGORY OF SERVICE	Total caseload carried	No. of persons involved
<i>Family &amp; Child Welfare</i>		
Children-in-Care	478	478
Child Protection	177	846
Foster Homes Approved	115	230
Adoption Services —		
Agency Placements	43	129
Step-Parent Adoptions	14	42
Adoption Homes Approved	28	46
Unmarried Parents	38	47
Family Service	323	1,125
<i>Public Assistance</i>		
Social Assistance	1,429	2,660
Blind Persons Allowance	3	3
Disabled Persons Allowance	3	3
<i>Geriatric Care</i>		
Nursing & Senior Citizens Homes	81	81
TOTAL	2,732	5,690

with the provisions of the Blind and Disabled Persons Ordinances. These fixed allowances can be supplemented under the Social Assistance program.

The Social Assistance program experienced a caseload decrease of 10 per cent during the year. The program caseload was 1,429 cases involving 2,660 recipients. This represented a decrease of 156 cases and 274 recipients in comparison with the 1972-73 fiscal year. Expenditure for Social Assistance during 1973-74 totalled \$537,000, an increase of \$112,000 over the previous fiscal year.

The Guaranteed Subsistence Level concept which was introduced in 1972 under the social assistance program continued to provide a much improved standard of living for Yukon pensioners and for those non-pensioners who because of age, poor health, physical and mental disability or other form of incapacitation, were considered to be permanently excluded from the labour force. The minimum subsistence levels in effect at the fiscal year end were \$209 per month for a single person and \$396 per month for a married couple. The establishment of this income floor guaranteed that pensioners in receipt of Federal Old Age Security and the Maximum Guaranteed Income Supplement would receive a Territorial Supplementary Allowance of \$25 per month if single and \$45 per month for a married couple.

Social Assistance rates were increased during the year to reflect changes in the cost of food and other basic items of maintenance.

	Per Case Cost	Per Recipient Cost	Per Cap Cost
1972-73	\$268	\$145	\$21.80
1973-74	375	201	26.85

Public Assistance

Public Assistance in the Yukon encompasses the Social Assistance and the Categorical Assistance programs.

Services under the Social Assistance program are provided on the basis of need and include: a) financial assistance and

material aid to individuals and families, b) supplementary allowances to pensioners, c) income supplementation to low-income one-parent families, and d) health care services (other than Medicare). Categorical Assistance is extended to blind and permanently disabled persons in accordance

Family and Child Welfare Services

Services provided under this program consist of Family Service, Child Protection Children-in-Care, Foster Home and Adoption Home Services, and Services to Unmarried Parents. To supplement these services,

The Branch operates a number of child-care facilities in various Yukon communities and also has a well developed foster home program.

During the year, the program caseload was 1,216 cases representing services to 943 adults and children. In the major category of service, "Children-in-Care", there were 478 children in the care of the Director of Child Welfare. New admissions in the year totalled 171 with 205 children having been discharged from care, leaving 13 children still in care at March 31, 1974. Total days of care provided were 106,117 at an average per diem cost of \$5.10.

In the field of adoption services the Branch continued an aggressive adoption program which has once again resulted in finding adoptive homes for a considerable number of our permanent wards in foster care. The Branch placed 23 children in approved adoption homes both in and outside of the Yukon Territory and assumed responsibility for one adoption placement transfer to the Yukon from another province. Placements outside of the Territory are made only when no suitable homes are available in the Yukon and are made through the appropriate child welfare authorities under existing reciprocal agreements. Of the 23 adoption placements, five were infants relinquished for adoption at birth and 18 were foster children who had been in permanent wardship care for varying periods ranging from two to 13 years.

## FACILITIES

### Geriatric

The nursing and senior citizens homes operated by the Branch can provide nursing care and residential accommodation for a total of 90 persons with a capability of expansion to 110 persons.

During the year, renovations were made in one wing of the existing Macaulay Lodge in Whitehorse to convert a number of residential units to provide accommodation for nine persons requiring intermediate nursing care. It is anticipated that these new units together with the 15 bed nursing home in Dawson City will meet our needs in this area of geriatric care for an interim period of two years.

Geriatric facilities operated by the Branch provided a total of 20,484 days of accommodation and care for an average occupancy rate of 70 per cent. Total operating costs for all three facilities amounted to \$366,000 for an average per diem cost of \$17.85.

### Child-Care

During the year in review the Branch operated eight group-receiving homes in various communities throughout the Yukon. Total capacity of these homes is 71 children.

All government-owned child-care facilities are operated by houseparents on a private contractual arrangement with the Branch. A total of 16,876 days of care were provided in these facilities during 1973-74 at an average per diem cost of \$13.04.

### General

In June 1973, the Yukon hosted the annual conference of the Provincial-Territorial Directors of Child Welfare. All 10 provinces and the Northwest Territories were represented. The conference proved to be very successful and constructive and dealt with a number of issues of major concern to the Canadian Directors of Child Welfare.

In February 1974, a foster home campaign was initiated and an extensive public information program was conducted with the assistance of the Territorial Tourism and Information Branch. Special brochures on adoption and foster home care were developed, printed and circulated throughout the Territory.

### Plans for 1974-75

Plans are underway to install an elevator and to expand the Macaulay Lodge Senior Citizens' Home. The addition to the Lodge is intended to replace the residential units converted to intermediate nursing care units in 1973/74 and will provide 10 single residential units. The addition to the Lodge will maintain residential accommodation capacity at 40.

It is anticipated that we will phase out the Blind Persons Allowance and Disabled

Persons Allowance programs and bring the current recipients in under the special allowance provision of the Social Assistance program which provides for pensioners and non-pensioners who are permanent exclusions from the labour force, a fixed categorical allowance in excess of the amount of the Blind and Disabled Persons Allowance.

During 1974-75 the Branch plans to review its group and receiving home placement policy with the view of developing a program of better selectivity in the use of these facilities, particularly for those children with special problems and needs.

This year the Branch is planning to place a greater emphasis on community development and the coordination of services provided by existing community resources and agencies. It is also planned to develop workshops and training seminars for foster parents and group home houseparents and to hold a number of seminars for the professional staff as part of the Branch's on-going staff development program.

## DEPARTMENT OF HIGHWAYS AND PUBLIC WORKS

### Responsibilities

To maintain and improve all roads and highways within the Yukon Territory with the exception of municipal roads. To maintain and improve all buildings owned by the Territory and to design and construct all new buildings for the Territorial Government. To provide professional engineering services and advice to the Commissioner and all Territorial Departments. To co-ordinate federally financed roads or Public Works projects with the appropriate branches of the Department of Indian Affairs and Northern Development under the Federal-Territorial Engineering Services Agreement. To conduct liaison with the Federal Department of Public Works in matters pertaining to the maintenance of the Yukon Section of the Alaska Highway and also the Yukon and B.C. Sections of the Haines Road falling under the Alaska Highway Maintenance Agreement between the Federal Department of Public Works and the Commissioner. To plan, design and implement construction of water and sewer and sewage treatment facilities for Yukon Communities in consultation

with the Department of Local Government excluding the City of Whitehorse, the City of Dawson and the Town of Faro but to assist these communities whenever required in their Capital and O&M programs. To maintain all airstrips and airports with the exception of major airports maintained by M.O.T. To operate ferries at Dawson City and Ross River.

### Long-term Plans

To continue to upgrade the existing road system by improving all grades and alignments and by widening to a point where these roads are ready for paving. To construct new airstrips and to improve existing ones throughout the Territory to keep pace with increased use and new needs created by rapid economic development of the Territory. To improve the appearance of existing buildings and grounds, to reconstruct and alter buildings in line with changing needs and to construct new buildings for all Territorial departments on a planned basis.

### Review of 1973-74 Operations

Following the transfer of the Yukon Section of the Alaska Highway and the Yukon and B.C. Sections of the Haines Road from the Federal Department of Public Works to the Territory on April 1, 1972, full integration of employees, equipment, stores and facilities was completed and is working well. The total mileage of roads maintained by Territorial forces has increased to 2,431.8 miles of which 1,803.2 miles were maintained on a year-round basis and 628.6 miles during the summer months only. Employment in the Highway Maintenance Section reached the high point in July, 1973 with 343 employees and the low point in January, 1974 with 130 employees. The 55 ton-ferry crossing the Yukon River at Dawson handled 26,746 vehicles during the 1973 summer season as compared to 21,155 vehicles in 1972 and total number of passengers increased from 52,505 in 1972 to the summer of 1973. The cost of the Dawson-ferry operation increased from \$108,000 in 1972 to \$139,000 in 1973. In addition a skyline was operated during freeze-up and break-up periods and an ice bridge was constructed in Dawson City for winter traffic. The cable ferry operated over the Pelly River at Ross River also had a

substantial increase in traffic due to mining explorations off the North Canol Road near the Yukon-N.W.T. Boundary. In addition 30 airstrips and two seaplane bases were maintained. The Mayo and Dawson City airports were maintained on behalf of M.O.T.

The construction of the Faro Airport to 3,000 feet was completed, the Beaver Creek Airport extension to 5,000 feet was completed, a new gravel runway 5,500 feet in length was constructed in Ross River and a number of minor improvements were made to other airstrips.

The former Projects Section of the Department was split during the year into two Sections, the Highway Construction Section and the Architectural Section. An Architect was hired to head the Architectural Section.

The Highway Construction Section of the Department continued upgrading of existing highways to established standards. The major projects in 1973-74 were on the Campbell Highway where highway was improved to Trunk Highway Standards under two major contracts from Mile 318-342, a total of 44 miles ending at the junction of the Campbell Highway and the Whitehorse-Keno Road. The paving program on the Whitehorse-Keno Road was continued from Mile 8 to Mile 20. During the year the improvement of the Tagish and Atlin Roads was also continued. Minor improvements were carried out on Territorial Recreational Roads. The total expenditure for Road Improvements was approximately \$2.2 million. Extensive pre-engineering surveys for future road reconstruction programs were also carried out.

The building construction program carried out by the Department (excluding Low Cost Housing Programs of the Yukon Housing Corporation) totalled approximately \$1,200,000 and included the completion of the Junior Secondary School in Whitehorse, the completion of the Selkirk School Addition and the Jack Hulland School Addition in Whitehorse, additions to the Watson Lake and Teslin Schools and the addition to the Watson Lake Administration Building and the commencement of the Robert Service School Addition in Dawson City. The emphasis was on planning and designing for future projects such as the proposed Juvenile Training Home for Wolf Creek, the proposed addition to the Macaulay Lodge in Whitehorse, the proposed Administration Building for Haines Junction, the proposed new school for Ross River, the proposed Airport Terminal

Building for Dawson City, the proposed major addition to the Whitehorse Workshop and others. Consultation with the Federal Department of Public Works for the new Territorial Administration Building in Whitehorse was extensive. The Architectural Section also assisted the Yukon Housing Corporation to a great extent in their various low cost and rental/purchase housing programs.

The Building Maintenance Section continued to maintain all buildings owned by the Territory with a staff of 32 tradesmen.

The Mechanical Section continued to repair and overhaul all Territorially owned equipment out of workshops in Whitehorse Dawson City and Watson Lake and through Field Mechanics with a mechanical and support staff of 87.

The Municipal Engineering Section of the Department continued to assist the Department of Local Government in community planning, land disposal and planning and designing of water and sewer extensions, new water and sewer systems and sewage treatment planning.

The Department employed 556 employees in July, 1973 and 302 employees in January, 1974. The total Operation and Maintenance expenditure for the Department for 1973-74 is estimated to be \$9.7 million.

### Plans for 1974-75

Temporary Highway Maintenance Camp will be constructed at M.P. 166 on the Dempster Highway until the permanent camp at Eagle River, M.P. 237 is completed in late 1975. This temporary camp will be relocated at a later date to a location near the N.W.T. Boundary. The Whitehorse Workshop will be extended by 25,000 square feet to allow combination of the Automotive and Heavy Duty Workshops. Purely territorial roads will continue to be upgraded. The Stewart-Crossing-Dawson Road falling under the Federal-Territorial Engineering Services Agreement will be improved to Trunk Highway Standards from Mile 0 to Mile 65. The Campbell Highway also falling under the Agreement will receive new drainage structures. We will continue our Recreational Roads Construction program and our Ground Improvement program.

On the Highway Maintenance side we will continue our Dust Control program with the use of calcium chloride on roads where the daily traffic density is over 250 vehicles



Building Construction programs as proposed and listed by other departments will be carried out.

## THE DEPARTMENT OF LEGAL AFFAIRS

### Responsibilities

The Department is responsible for administering justice throughout the Territory. The Territorial Court System includes the Yukon Court of Appeal, the Supreme Court and Magistrate's Court, which are located in Whitehorse; and Justice of the Peace Courts servicing the outlying communities. When required the Magistrate's Court travels on circuit.

Small Debt Officials are located in Whitehorse, Dawson City and Watson Lake, having jurisdiction up to \$500.00.

Juvenile offenders are dealt with pursuant to the Juvenile Delinquents' Act of Canada by federally appointed lay Juvenile Court Judges.

The Federal Department of Justice maintains a Crown Prosecutor's office in Whitehorse for prosecution of Criminal Code and Federal offences.

The Department supervises the drafting of legal documents, Ordinances and Regulations, and provides legal services to the Commissioner, the Territorial Council, and individual Departments of the Territorial Government.

### Long-term Plans

The establishment of an additional fully-staffed Magistrate's Court and the introduction of program concerning comprehensive jurisdiction of a single Family Court.

### Review of 1973-1974 Operations

The absence of a permanent magistrate hampered the efficient operation of the Magistrates' Court during the summer months when this Court's case load was at its peak.

With the appointment of a permanent magistrate delays in disposing of trials were reduced.

Responsibility for Maintenance and Reciprocal Enforcement of Maintenance matters formerly handled by the Crown Attorney on behalf of the Territory reverted to this Department during the year.

An Annual Justice of the Peace Conference was held in Whitehorse as part of a continuing educational upgrading policy.

The Department co-ordinated a seminar for federal, territorial and municipal enforcement personnel with instructional assistance from the Crown Attorney's Department and the Royal Canadian Mounted Police.

One hundred and forty-eight indigent accused were provided criminal legal aid during the year.

The courtroom facilities in the Magistrate's Court in Whitehorse were heavily taxed during peak case load. Outside of Whitehorse, permanent courtrooms have been established in the Territorial buildings in Watson Lake and Dawson City, with community club facilities being utilized in the other outlying areas.

### Plans for 1974-1975

A comprehensive legal aid scheme extended to include civil legal aid is in preparation, together with a proposal to compensate victims of crime.

The Department is giving operational support to a federally funded training program to establish a native court worker in Whitehorse.

## DEPARTMENT OF LIQUOR CONTROL

### Responsibilities

The Liquor Control Department regulates the importing, distributing and retailing of all alcoholic beverages within the Liquor Ordinance and attendant Regulations. The Department, in liaison with the Yukon Liquor Board, is also responsible for the issuance of all liquor licences and permits, and the enforcement of the Liquor Ordinance.

### Long-term Plans

The gradual upgrading of all licensed outlets in the Territory.

New liquor stores will be added in areas where population and activities warrant this service.

The increase of services to the public in all areas is the aim of all who are involved in this Department.

### Review of 1973-1974 Operations

Further gradual upgrading of licensed premises was carried out with the co-operation of all Departments concerned. The Liquor Board's policy of meeting with all new applicants for licences as well as with

licensees who had requested interviews, has proven to be advantageous in conveying the aims of the Department in the areas of upgrading and enforcement.

Letters, newspaper advertisements and personnel interviews were used in order that licensees would realize their full responsibility with regard to serving of intoxicated or underage persons.

The division of the Central Warehouse into a warehouse section and licensed outlet store has greatly facilitated the handling of licensed outlet and store orders, as well as providing greater efficiency in stock control.

The trend in increased wine sales has also been noted in the Yukon, necessitating additional brands from various regions.

The use of brand code numbers was introduced, which also alleviates many control problems.

Consolidated orders from the United Kingdom and Central Europe now enable faster, cheaper service, as well as practically eliminating the pilferage problem from these areas.

Total sales (inc. surcharge) 1972-73

\$5,349,736.76

Total sales (inc. surcharge) 1973-74

\$5,967,225.14

Increase in sales during the year: 11.5 per cent

### Plans for 1974-75

Identity cards are being introduced into the Yukon Territory. These cards will be for sale to persons wishing to purchase, upon sufficient proof as requested. This will greatly assist the licensed operators and liquor store personnel in ascertaining the age of purchasers of alcohol.

More notices will be inserted in newspapers in order to make the public more aware of the dangers resulting from over-indulgence in alcohol, and impaired driving.

## DEPARTMENT OF LOCAL GOVERNMENT

### Local Government Branch

### Responsibilities

To provide municipal services for all unorganized communities in the Territory.

To assist in the establishment and operation of municipal services in Local Improvement Districts.

To maintain an advisory service and inspect municipalities to ensure compliance with ordinances pertaining to municipalities.

To develop policies so that municipalities of various sizes can provide economical services to their taxpayers.

**Long-term Plans**

To provide and continually update municipal procedure manuals for the guidance of officers in small communities.

To implement and upgrade general plans, and zoning regulations in all municipalities and unorganized communities, to ensure that development takes place in an orderly manner.

To promote local self-government establishment, giving local people the authority and responsibility to deal with local matters.

To improve the quality of life enjoyed by residents of Yukon communities through orderly installation of urban facilities and utilities to each community where economically justifiable.

**Review of 1973-74 Operations**

The preparation of a Planning Ordinance was commenced which will be implemented in 1974.

The community of Carmacks and Teslin obtained the status of a Local Improvement District.

Community development plans and related zoning regulations have been developed for several Yukon communities. These plans will be a great asset as a guide for future land disposal policies and municipal servicing of communities.

A request for a boundary extension was received from the Haines Junction L.I.D., and is presently under consideration.

A piped water system is being installed in Watson Lake, and a sewer system attached to a package sewer treatment plant installed in Carmacks. An expanded sewer system was installed for Haines Junction.

**Plans for 1974-75**

To establish close liaison with native agencies to promote the joint-use concept of municipal services.

To introduce and provide training to municipal officers for more advanced accounting procedures.

To review the status of local improvement districts and develop this type of self-government in a number of existing unorganized communities.

To review the municipal services provided to each community to ensure that the most economical methods are being followed and that residents have adequate services.

To upgrade operational and maintenance procedures for utility services and provide trained utility operators to communities where new plant and services are being installed.

*Protective Services Branch*

**Responsibilities**

To implement and administer an effective fire prevention program to reduce loss of life and damage to property.

To review building plans and specifications for conformity with Territorial and national building and electrical standards.

To maintain ongoing programs for the improvement of fire prevention, building, plumbing and electrical standards within buildings.

To disseminate information to the general public and industry for reducing domestic and industrial fires.

To administer ambulance services in the communities of Dawson, Faro, Carmacks, and Whitehorse.

**Review of 1973-74 Operations**

Eighty fires were reported in 1973, an increase of one as compared to the 1972 total of 79.

Fire losses in 1973 amounted to \$517,957, an increase of \$135,721 as compared to the 1972 dollar loss of \$382,236. Of the total 1973 loss, \$358,939 or 69.3 per cent was covered by insurance.

Two fire fatalities and nine injuries as a result of fire were recorded in 1973.

Three large loss fires (over \$50,000) occurred in 1973, destroying a snowmobile sales office and general store in Mayo and bunk-house complex in Faro, total loss \$191,000.

Faro Volunteer Fire Department was awarded an honourable mention in the 1973 National Fire Prevention Competition, Division F. The award is in recognition of all-round efficiency in fire prevention.

Six hundred and twenty-eight electrical permits were issued in 1973, for a total of \$6,540.45 in fees, \$4,023.15 residential, and \$2,517.30 commercial.

Sixty-three building permits were issued for total construction value of \$1,777,960 and fees collected were \$3,347.

Total ambulance runs for 1973 were: Faro, 33; Dawson, 39; Carmacks, 40; and Whitehorse, 525. Two locations, Dawson and Whitehorse, have been operating only since March, 1973.

**Plans for 1974-75**

With the hiring of a Chief Building Inspector, a Chief Electrical Inspector and a Gas/Plumbing Inspector, the requirements of the 1970 National Building Code of Canada will be fully implemented, with the expectation this will provide a higher standard of structural, electrical and fire safety requirements.

*Assessment Branch*

**Responsibilities**

The Government of the Yukon Territory is responsible for the assessment of all properties in the Yukon Territory.

Preparation of assessment rolls for municipalities and the Yukon Territorial Government.

Related studies including courts of revision, land appraisals, etc.

**Review of 1973-74 Operations**

Assessment figures for 1974 and corresponding 1973 figures; the following is a summary of total assessed values

	1974	1973
1. City of Whitehorse	\$ 67,000,000	\$ 62,450,150
2. Dawson City	2,350,000	1,970,540
3. Town of Faro	5,650,000	5,596,080
4. All other areas	28,250,000	31,138,330
Total	\$103,250,000	\$101,277,710

## Plans for 1974-75

General re-assessments in communities where changes have occurred, due to development, planning changes, etc.

Assessments of mines and mining operations to be reviewed

Revise assessment equalization methods.

## Community planning and Land Disposal Services

### Responsibilities

The planning of Yukon communities and land disposal areas to permit orderly economic development.

The sale, lease or other disposition of lands under the administration, control and management of the Commissioner of the Yukon Territory.

### Long-term Plans

To prepare community plans and zoning control legislation for every Yukon community and ensure orderly land use in communities and in the peripheral areas.

To establish a land disposal policy and to administer the disposition of land to permit the orderly, efficient and economic use of all lands in the Yukon.

### Review of 1973-74 Operations

New regulations governing the disposition of lands controlled by the Commissioner were put into operation. These have resulted in the sale of Yukon lands by public tender and the leasing of lands according to a definite set of standards.

Land transactions during the past year amounted to \$386,860.00 and included 252 sales in the Riverdale subdivision of the City of Whitehorse. In addition, there were 244 agreements for sale in other areas of the Yukon.

## Plans for 1974-75

The addition of a full time planner will allow for extensive community and regional planning work throughout the Yukon.

Agricultural consultant will undertake a study to outline farming potential in the Yukon and make recommendations for future agricultural land use policy.

## DEPARTMENT OF TERRITORIAL SECRETARY AND REGISTRAR GENERAL

The Department is responsible for the following:

- Registration Services
  - companies
  - securities
  - societies
  - vital statistics
  - business licences
  - co-operative associations
  - credit unions
  - partnerships
  - document registrations
  - motion pictures
  - insurance
- Inspection Services
  - labour standards
  - liquor
  - steam boilers
  - public health
- Motor Vehicles
  - transport public utilities
  - driving program
  - Watson Lake checkstation and Whitehorse weigh scales
- Workmen's Compensation
- Public Administrator
- Records Office
- Information Canada

The primary operations are located at headquarters in Whitehorse, with agents located at Watson Lake, Haines Junction, Mayo, Dawson and weighscale operators at Watson Lake, Whitehorse and Haines Junction on the Alaska Highway.

### Long-term Plans

The Inspection Branch of the Department has initiated a safety inspection program designed to assist employers in the Territory to maintain safe working conditions for their employees.

### Review of 1973-74 Operations

#### Registration Services

- Under the Business Licence Ordinance, a total of 460 licences were issued, 151 of these by the Yukon Territorial Agents.
- Under the Insurance Ordinance, 36 Salesmen's Licences were issued and nine Salaried Officials were licensed.

- Under the Securities Ordinance 10 Prospectuses were filed, one amendment to a prospectus was filed and one Certificate of Exemption from filing a prospectus was issued. Three Brokers Licences, seven Salesmen Licences, two Security Issuers Licences were issued.
- Under the Societies Ordinance, 24 Societies were incorporated, and 68 Financial Statements were registered.
- Under the Motion Pictures Ordinance, three establishments and three operators were licensed.
- Under the Companies Ordinance, 80 companies became new Yukon Incorporations, 91 were licensed extra-territorially, a total of 171 new companies.
- Under the Vital Statistics Ordinance, 446 certificates of registration of birth; 120 certificates of registration of death; and 208 marriages were recorded by the Registrar. Also indexed with the Dominion Bureau of Statistics were five delayed registrations of birth, 15 legitimizations, 27 name changes, three missing persons, and 25 adoptions.
- Under the Bills of Sale Ordinance, Conditional Sale Ordinance, Assignment of Book Debts ordinance and Garagemen's Lien Ordinance, 4,067 documents were registered.
- Under the Partnership Ordinance, 10 partnerships were filed.
- Recorded in the Professional Register were licences issued to two chiropractors, four dentists, three dental therapists, 46 doctors, 80 lawyers, three optometrists, and seven pharmacists.

#### Inspection Services

Nine hundred and nine liquor inspections were completed during the year with follow-up correspondence in each case. Two liquor licence suspensions were imposed, one of them for three days, and the other for seven days. One conviction was obtained under the provisions of the Liquor Ordinance.

Three hundred and eight inspections were completed under the Labour standards Ordinance, and a total of 185 wage complaints were processed. Enforcement of the Labour Standards Ordinance resulted in the collection of \$50,219.14 in outstanding wage entitlements. Four convictions were obtained pursuant to the Labour Standards Ordinance.



Two hundred and seventy-five matters were investigated for the Workmen's Compensation Office, in addition to 152 inspections under the Accident Prevention Regulations. One conviction was registered under the Ordinance.

Two investigations were completed under the provisions of the Fuel Oil Tax Ordinance which resulted in the collection of \$364.56 in outstanding fuel tax.

One hundred and thirty two investigations were conducted under the Motor Vehicles Ordinance, and an additional 43 in respect of the Highway Signs Regulations. A total of \$2,550 in outstanding registration fees were collected for the Motor Vehicles Branch. 14 convictions were obtained as a result of charges laid under the Motor Vehicles Ordinance.

One hundred and twenty-five matters were investigated in relation to the Business Licence Ordinance, and 25 additional investigations were carried out relative to the Companies Ordinance.

The Branch co-ordinated the inspection of 33 elevators and other conveyances, in addition to a total of 352 inspections pursuant to the Steam Boilers Ordinance.

One hundred and fifty-four inspections were carried out to enforce the provisions of the Yukon Health Care Insurance Plan Ordinance, and premiums collected totalled \$2,285.75. Six convictions were obtained under the Ordinance.

The Branch investigated four matters relative to the Transport Public Utilities Ordinance and one under the provisions of the Yukon Lands Ordinance.

#### *Workmen's Compensation*

The Council of the Yukon Territory at its sittings in July, 1973 passed the new Workmen's Compensation Ordinance. This Ordinance provided for the Yukon Government to take over the funding of the Workmen's Compensation in the Yukon Territory effective October 1, 1973.

The principle of coverage is in keeping with Canadian Workmen's Compensation under the concept of collective liability within an industry. Industries are classified into classes on the basis of industrial undertaking and accident hazards.

The Workmen's Compensation office processed 1,418 accident claims during the calendar year 1973.

#### *Public Administrator*

The Public Administrator commenced the calendar year with 110 current files to which

were added 71 files consisting of 65 deceased estates, three for mentally incompetent patients and three missing persons. During the year files were closed in relation to 64 estates of deceased persons; seven patients and two missing persons, leaving a total of 108 current files being maintained on the 31st day of December, 1973.

#### *Motor Vehicles*

Under the Motor Vehicles Ordinance 26,690 licences, certificates and registrations were issued.

Weighscales at Watson Lake, Whitehorse, and Haines Junction operated on a 24-hour basis. Each weighscale employed one supervisor, three operators and one casual. All vehicles of 20,000 lb. or more gross vehicle weight are checked for legal weight, proper licensing and adherence to requirements under the fuel tax ordinance. Where necessary licence plates or permits are issued. Further where the vehicle is oversize or overweight a permit or penalty fee is assessed according to circumstances.

Fuel emblems or one trip fuel permits are sold where applicable.

A total of 23,576 vehicles were checked and recorded through the weighscales.

Total revenue from all sources was \$791,315.67

#### *Records Office*

The Records Office and its two sub-stations opened 441 new files and handled 509,595 pieces of mail. The volume of mail increased by 76,967 pieces over the previous year.

The implementation of a Records Management Program during 1973 resulted in the transfer of 2,543 cubic feet of closed records from offices and storage areas to the Records Centre for interim storage until due for destruction or transfer to the archives. This program has alleviated space problems in various government departments and at the same time has reduced the costs of handling and storing records and documents.

#### *Queen's Printer*

The Territorial Secretary provides various printing equipment making it possible to handle the volume of printing required by the government. The Queen's Printer is responsible for the printing of all Ordinances, amendments to the Ordinances of the Yukon Territory, the printing of regulations, votes and proceedings of the Council Sessions and is responsible for approving all publications of Gazette Notices as required by certain ordinances of the Yukon.

## **DEPARTMENT OF TOURISM, CONSERVATION AND INFORMATION SERVICES**

### *Game Branch*

#### **Responsibilities**

This Branch is responsible for the administration and enforcement of the Game Ordinance, Fur Export Tax Ordinance, Pounds Ordinance, Migratory Birds Convention Act, Canada Wildlife Act and Freshwater Fishery Regulations, as well as for conducting programs that are necessary for proper wildlife resource management.

#### **Long-term Plans**

While the enforcement staff has now reached a number which is adequate for the time, the technical staff (biologist and technicians) is still in the infancy. The long-term forecasts call for four biologists and four technicians by the year 1978.

Game surveys will continue until a complete inventory of the Yukon's wildlife resource has been made. Stricter hunting regulations can be anticipated in certain areas of the Yukon where intensive hunting pressure has depleted certain game populations, after the initiation of game management zones. More emphasis will be placed on public education by holding courses for hunters and trappers and guides every winter.

#### **Review of 1973-74 Operations**

New game guardians were hired for the Haines Junction and Dawson City detachments. The opening up of the Faro detachment was postponed until the 1974-75 fiscal year.

Game surveys for sheep and goats were carried out in southcentral Yukon, an area which receives the highest hunting pressure, during June and July 1973.

Winter surveys for moose were carried out in the Teslin, Tarfu and Snafu Lake areas as well as the Nisutlin River basin during February 1974.

Hunters' check stations were maintained during the antlerless moose season at the south Canol Road and during the caribou season on the Dempster Highway.

Game Branch personnel assisted the Canadian Wildlife Service in research projects on polar bears and the Porcupine caribou herd.

An attempt was made by the biological staff to measure all sheep and goat horns

ken in the Yukon during the 1973-74 season as well as all grizzly skulls.

Detailed questionnaires were sent to all resident as well as non-resident hunters. Reports on the analysis of these questionnaires were prepared to show the economic importance of the Yukon's wildlife resource and to reveal such statistics and hunters' access, and numbers of game animals taken in various areas of the Yukon. Information from these questionnaires will also be used to divide the Yukon into game management zones, a project which is presently in the proposal stage.

During the 1973-74 season there has been an increase of about 20 per cent of hunting licenses sold.

The fur prices have been high throughout the season and the harvest of furbearing animals by trappers is estimated to exceed the take of 1972-73 by about 20 per cent.

#### Plans for 1974-75

New detachments will be opened in Faro, Mayo, Old Crow, and there will also be a temporary enforcement crew at the Yukon's Arctic coast during the summer months.

Game surveys will be carried out in the Ruby and Nisling ranges as well as the British Mountains.

It was planned to initiate a hunters' training program in the latter part of the 1974-75 winter.

It is hoped that the proposal of establishing game management zones will come into effect for the forthcoming 1974-75 hunting season.

#### Library Services Branch

##### Responsibilities

To provide library services to the public and to schools throughout the Yukon, and to provide archival services under the authority of the Archives Ordinance.

##### Long-term Plans

To work towards providing public and school library service at the level of accepted standards of library service. To co-operate, through the agency of the Yukon Archives, in the development of a Territorial Government system of records management for current, non-current, and permanent government records; and to acquire and maintain a collection of the history of the Yukon as recorded in non-governmental sources.

#### Review of 1973-74 Operations

With a stock of approximately 120,000 catalogued books the Yukon Regional Library served 124 outlets in various Yukon communities. On a rotating basis 27,988 books were shipped to these communities. The cataloguing and processing of 21,747 items of library materials (new books, added copies, paperbacks and audio-visual materials) was completed. The members of the Whitehorse Public Library borrowed 74,680 books during the year. The film library distributed 11,320 films throughout the Territory which were viewed by a total of 225,055 persons.

The Art Gallery of the Whitehorse Public Library exhibited major exhibitions from Western and Northern Canada. Federal Opportunities For Youth grants from the National Film Board allowed the film library to hire an itinerant projectionist over the summer. An oral history program was continued with Skookum Jim Hall.

#### Plans for 1974-75

Additional Archives staff will permit increased concentration on the indexing and organizing of acquired Archives collections. Special programs in school and public library will continue to service children and young people, and further development of training programs for branch library workers. The object of both areas is to increase utilization of library and archives facilities.

#### Number of books sent out — April 1, 1973 — March 31, 1974

Branches	5,644 + 3,293
Book Deposit Stations	5,129
Indian Band Offices	744
Indian Resource Centre	178
Organizations & Institutions	536
Individuals	495
Families	1,384
Schools — Yukon	12,152
Schools — B.C.	1,327
Kindergartens	399
Total books shipped	27,988
	3,293
	31,281

#### Books — Records — A/V Material — Paperbacks processed

New Books	6,547
Added Copies	9,182
Paperbacks	5,859
Records	105 + 60
A/V Material	54
	21,807
Cat. Cards	46,116

#### Tourism and Information Branch

##### Responsibilities

The branch is responsible for promoting travel to the Yukon Territory and encouraging the development of tourist attractions and facilities within the Territory.

In addition, it is responsible for public information about government activities.

##### Long-term Plans

Continued advertising and promotion to stimulate travel to the Yukon, programs designed to assist the development of the Territory's tourist facilities and services, and provision of an adequate information service.

#### Review of 1973-74 Operations

Tourism showed a 15 percent increase, with 310,000 visitors reported. They spent an estimated \$25 million.

Recreation vehicles constituted the bulk of the traffic. Bus tours increased and use of commercial transportation and facilities was generally up.

The branch carried out studies towards establishing policy and legislation as a second step in the development of a territorial parks program.

Klondike '73 celebrations aimed at commemorating the founding of the Yukon Territory and the 75th anniversary of the Klondike Gold Rush were successfully staged throughout the Territory, with considerable community and visitor involvement.

The introduction of a Museum Grants program in 1972 provided incentive for expansion of the MacBride Museum in Whitehorse and the start of a museum in Teslin, in addition to continued work on the Burwash Museum.

Several writers, film crews and travel agents were hosted. The branch also shared costs with the Federal Government on a major film production on the Yukon River.

Yukon House in Vancouver expanded its tourist promotion and general information services, particularly in the areas of media relations and business inquiries.

Tourist information centres were open throughout the summer at Watson Lake, Beaver Creek, Haines Junction and Dawson City in the Yukon and the branch shared in the cost of operating the Chamber of Commerce Information Centre in Whitehorse.

Information Services expanded considerably its services to all departments. The photo section continued its efforts in developing and adequate photo library.

#### **Plans for 1974-75**

To display a travel exhibit at major sports and travel shows.

Continued development of plans for Territorial parks.

Undertake research projects on tourist development.

Expand involvement with the industry within the Territory.

Continued development of photo and information sections.

Development of a community rest stop program.

### **DEPARTMENT OF TREASURY**

#### **Responsibilities**

Management of the Yukon Consolidated Revenue Fund.

Collection of all taxes and revenues.

Supervision, control and direction of all matters related to the financial affairs of the Territory.

Data centre for all government departments.

Central purchasing and central stores.

#### **Long-term Plans**

Continued improvement of financial management techniques and introduction of combined financial and operational management reporting.

Conversion of data processing system from card system to disc system.

Development of a total traffic control of movement of Government staff and materials.

### **Review of 1972-73 Operations**

Operation and maintenance expenditures for the fiscal year ending March 31, 1973 increased to \$27,319,614 from \$18,883,948 for the previous fiscal year. This increase is attributable to higher wages, the Alaska Highway Maintenance Agreement, and to increased costs under the statutory health and welfare programs.

Revenue, recoveries and operating deficit grant related to operation and maintenance increased to \$30,333,709 for the period ending March 31, 1973 from \$20,202,875 for the previous fiscal year. Increases in this area resulted from imposed tax increases, normal volume increases, higher recoveries as a result of higher expenditures, and a substantial increase in the deficit grant amounting to \$3,551,000.

#### **Project and Loan Capital**

Capital and loan expenditures for the fiscal year ending March 31, 1973 amounted to \$10,633,312 of which \$3,023,380 was financed through cost-sharing agreements, with the balance being funded by way of loans from the Federal Government.

#### **Plans for 1974-75**

Financial planning has been completed and expectations are for a well-planned and controlled operation. Data processing planning is under way in the corrections and welfare departments to provide statistical data and other clerical saving reports. Central purchasing and stores introduced a new purchasing system in early 1974 to improve government operations and reduce costs of materials and in administering this function.



## NATIONAL ENERGY BOARD (NEB)

### Responsibilities

The N.E.B. is responsible for approving the construction and operation of all pipelines passing from the Yukon and Northwest Territories. To this end the Board conducts continual studies related to the design, construction, operation, maintenance and safety of pipelines, marketing and rate structures. In addition the Board also conducts studies to enable it to estimate oil and gas reserves in the North. Applications for pipeline construction and licences for petroleum production are received and reviewed in accordance with the National Energy Board Act. Those considered acceptable are sent to the Governor-in-Council with recommendation for their authorization, the others are rejected.

After a pipeline has been authorized, plans, profiles and books of reference are deposited with the Land Registrar of the district involved. The N.E.B. then reviews and approves the engineering and associated drawings for design suitability and adequacy of safety requirements. It monitors pipeline construction and testing, and when satisfied at the completed pipeline meets design and safety authorizes its going on stream.

The Board also ensures that the financial responsibilities of the operating company are correctly classified, for adjudging possibilities of rate control and pricing of oil or natural gas.

### Long-term Plans

There appears to be some urgency among companies having an interest in the development of pipelines in the North for transmission of gas from several areas throughout the Territories, and the Board is giving the question of feasibility of construction of pipelines from the Arctic lands. Difficulties of construction relating

to pack ice and deep fiord type water crossings are a matter which must be investigated and construction feasibility established. The Board is taking steps to assess this aspect, which would enable it to prepare for a public hearing when it becomes necessary to deal with a pipeline application of this type.

### Review of 1973-74 Operations

#### Plans for 1974-75

The following plans and projects are current but are expected to extend to 1975.

#### Project 73-6, Mackenzie Valley Oil Pipeline

This project relates to the active assembly of engineering and other data regarding a proposed oil pipeline system down the Mackenzie Valley. The present status of this project is in doubt, but it could be resuscitated by discoveries of oil.

#### Project 73-11, Oil Regulations

Drafting of regulations concerning oil pipelines as a whole, but including those particularly related to the inclement weather conditions of the Yukon and Northwest Territories. This is not a first priority project as greater emphasis is being placed on the gas pipeline regulations.

#### Project 74-12, Pipeline Materials

This project covers investigations of pipe materials and in particular those suitable to low temperature conditions. The necessity for such pipe to possess high notch ductility properties is also included in this investigation.

#### Project 73-38, Environmental Policy

Details of environmental aspects being obtained from the Department of the

Environment and Environmental Liaison Group are being incorporated into proposed regulation to ensure that the construction of an oil or gas pipeline will meet acceptable requirements of an environmental policy.

#### Project 73-21, Economic Impact Study (Bank of Canada)

This study is being conducted by the National Energy Board, in association with the Bank of Canada, to determine the economic effects of constructing major pipelines in the Territories.

#### Project 73-29, Long-Range Preparation for a Northern Gas Pipeline

This project involves the compilation and preparation of data useful in the formulation of questions for a public hearing in respect to a northern gas pipeline.

## NATIONAL FILM BOARD (NFB)

### Responsibilities

The production of motion pictures, film loops, film strips, slide sets and still photo exhibits about the Canadian North, its people and their activities, its industries, resources, and institutions; the distribution of these materials in Canada and abroad; and the distribution in the North of such material interpreting Canada and exploring issues of national interest; counsel to federal government agencies concerning the application of audio-visual media and the planning, production and distribution of departmental films for information, instruction, training and cultural purposes.

### Long-term Plans

Normal planning to meet responsibilities.

### Review of 1973-74 Operations

### Staff

No full-time or part-time NFB staff reside in the North. Film crews, trainers and distribution representatives travel north on assignment.

### Film Production

The NFB produced for its own program "Sub-Igloo" and a filmstrip "Arctic Delta Town".

The following foreign language versions were completed during the year: "Glaces (Freeze-in)" French, "Death of a Legend" in Spanish and Dutch, "Nahanni" in Ukrainian, "Tuktu and His Magic Bow", "Tuktu and the Caribou Hunt" and "Tuktu and His Animal Friends" in Turkish.

The following films were commissioned to the NFB by the Department of Indian Affairs and Northern Development: "Pictures Out of My Life", "Sananguagat - Inuit Masterworks", "Le Hibou and Le

Corbeau", "The Owl and the Lemming (filmstrip)".

The following films were commissioned to the NFB by the Department of National Defence: "National Frontiers - Frontières Nationales", "Aviators of Hudson Strait", "Northern Challenge" produced by Roozboom Productions.

"Space Connections" was commissioned to the NFB by the Department of Communications.

"Arctic Tundra" (Part of Series Landscape of Canada) was commissioned to the NFB by the Department of National Museums and produced by Mosaic Films.

The French language version of "Cry of the Wild" entitled "Le Chant De La Forêt" was produced by a theatrical distributor.

A workshop was held at Cape Dorset to train Inuit in animation film-making and was attended by 10 people. A production entitled "Animation from Cape Dorset" was completed. This was co-sponsored by the NFB, the Department of Indian and Northern Affairs and the Northwest Territories' Council.

### Distribution

The NFB's westernmost distribution region combines British Columbia and the Yukon. NFB services in the Yukon are provided through the Whitehorse Public Library, which has a film section, and also borrows from the NFB regional office in Vancouver.

The NFB's Outpost Film Library which was formerly in Ottawa has been transferred to Edmonton for English titles and to Montreal for French titles. This will provide easier access to users in the North.

The theatrical release of "Cry of the Wild" in the U.S.A. and Canada (English and French) has been a spectacular success.

Advice and organizational help in the Mackenzie District is provided by the NFB representative in Edmonton, who makes trips annually to the North. A student was hired to show films from the Whitehorse Library.

### Challenge for Change

The following three films were produced in 1973: "Cree Hunters of Mistassini", "The Greenlanders" and "Labrador North".

### Plans for 1974-75

The NFB's plans for its own program call for the completion of the following films: "In the Search of the Bowhead Whale", "Arctic Four" (North Pole Under Water Exploration), "North of Dawson Creek", "Yukon". The French language series of films on the development of Northern Quebec is continuing and five documentary features are due to be produced in 1974-75 with the following tentative titles: "L'Abitibi, La Lance vers le Nord (two films)", "La Route de la Baie James" and "Les Indiens du Nord".

A film on the Vikings route to America will be started in 1974.

The NFB will complete films commissioned by the following departments: the Department of the Environment "Greater Snowgoose" (to be produced by International Cinemedia); the Department of Indian Affairs and Northern Development "Man the Hunter", and the Department of National Health and Welfare "Third Arctic Games". Two film workshops will be held. Twenty-five Inuit film makers will attend a film workshop at Frobisher Bay co-sponsored by the NFB and the Department of Indian Affairs and Northern Development. The second will take place at Cape Dorset where there will be a continuation of the

animation film workshop for Inuit film makers which held its first session in 1973. Once again the co-sponsors will be the NFB, the Department of Indian Affairs and Northern Development and the Northwest Territories' Council.

French language versions of the following two films will be produced: "*Cree Hunters of Mistassini*" and "*Sub Igloo*".



## NATIONAL MUSEUMS OF CANADA (NMC)

### NATIONAL MUSEUM OF NATURAL SCIENCES

#### *Botany Division*

##### **Responsibilities**

The Botany Division of the National Museum of Natural Sciences has an overall interest in botanical exploration and research in Canada's North.

##### **Long-term Plans**

The Botany Division plans to continue a general program of exploration, research and publication on the botany of arctic Canada and to co-operate with other institutions and individuals working in the same area.

#### *Phycology Section*

##### **Review of 1973-74 Operations**

The Curator, Dr. R.K.S. Lee, continued the project on "An Ecological and Bio-systematical Survey of the Benthic Marine Algae in the Canadian Arctic" with field work in August in the lower western region of the archipelago. With the aid of two scuba divers, ecological data and specimens were collected from 21 sites situated between the Cape Parry region of Amundsen Gulf to the lower eastern half of Victoria Island and Queen Maud Gulf.

##### **Plans for 1974-75**

A field party of scuba divers is expected to survey the marine algal communities in western Hudson Bay and northward to the Gulf of Boothia and King William Island.

##### **Long-term Plans**

Future work will be concentrated in the central and more northerly islands of the

archipelago. This will then complete at least a general survey of the benthic marine algae in the Canadian Arctic.

#### *Lichenology Section*

##### **Review of 1973 Operations**

General survey of the lichens on Bathurst Island near Polar Bear Pass. 242 specimens of lichens were collected and shipped back to the National Museum where they are now being identified. A list of the lichens will be provided for the use of scientists at the N.M.N.S. Field Station.

##### **Plans for 1974-75**

None

##### **Long-term Plans**

Field work, observations, and identifications concerned with lichens of arctic Canada will be done as needed. Many of the results will be passed on to Dr. John W. Thomson of the University of Wisconsin so that he can use the information in a Manual of the Lichens of the American Arctic.

#### *Bryology Section*

##### **Review of 1973-74 Operations**

Dr. Robert R. Ireland, Curator of Bryophytes, spent the period of July 17-24, 1973, collecting bryophytes in the environs of the National Museum of Natural Sciences Base Camp, near Goodsir Inlet, Bathurst Island. Approximately 500 numbers and 300 duplicates of bryophytes were collected.

#### *Vertebrate Ethology Section*

##### **Responsibilities**

The zoology division of the National Museum of Natural Sciences is one of the

primary contributors to the knowledge of animal species in Canada. Comprehensive faunal surveys are conducted and promoted and the museum keeps important collection of fauna and flora. Its scientific collections of arctic material are among the best in the world. This division co-operates with other government agencies and scientists of other countries interested in problems of the North.

The N.M.N.S. High Arctic Research Station was established in 1968 on Bathurst Island, N.W.T., in collaboration with the Polar Continental Shelf Project. The vertebrate ethology section is undertaking detailed, long-term studies at the station to investigate the relationships between species of arctic animals and the behavioural adaptations that enable them to survive in high arctic environments. This small field station permits some university students to undertake research and promotes public interest in conservation in the high arctic.

##### **Long-term Plans**

The current research at Bathurst Island will continue at least until September 1978. To provide good information on inter-specific relationships, population fluctuations, and effects of weather and climate in relation to behaviour, social organization, population sizes and breeding success, projects must be continuous and of long duration.

Most of the projects are continuations of those established in 1968. Some may become temporarily inactive when the species under study is present in very small numbers, does not breed, or is absent. Established projects tend to become more elaborate over a period of years.

Continuous records of phenological events during the field season are maintained

and the station weather data are submitted to the Atmospheric Environment Services.

The continuing studies emphasize arctic animals in their undisturbed natural environment and the research area is being proposed as a wildlife preserve by the tundra panel of the International Biological Program.

### Review of 1973-74 Operations

The research station was in operation from 9 April to 25 September 1973. The following projects were conducted:

**Floral and Fauna surveys:** Surveys were conducted during July in an area 20 miles S.W. of the station. Studies of nesting snowy owls and greater snow geese were carried out in this area.

**Social behaviour of ivory gulls.** A site was prepared near the nesting colony in preparation for next year's detailed studies. Several young gulls were banded.

**Life history and behaviour of red phalarope:** Documentation of breeding and nesting behaviour was continued.

**Breeding bird census.** 153 nests of 35 different species were discovered. Data on breeding success were obtained and 131 individuals were banded.

**Physiology and ecology of muskoxen.** Documentation of calving, maternal, and courtship behaviours. New 16 mm film footage was obtained for inclusion in film on muskox behaviour. Further observations of wolf-muskox interactions were made.

**Life history and ecology of varying lemming.** Continued accumulation of data on populations fluctuations in relation to weather and burrow availability.

**Botany.** A preliminary survey of lichens and mosses was conducted in the area of the research station.

**Meteorology.** Data was collected in two daily standard observations. Continuous records of sunshine, radiation, humidity, temperature and wind were also maintained.

**Objects inactive due to absence of animals were:** ethology of rock ptarmigan, snowy owl, and arctic hare.

### Plans for 1974-75

The projects involving birds and mammals will continue. New projects at the research station include:

preliminary study of spiders and mites.

**Microclimatology.**

Studies of muskox range and feeding habits.

Studies in the area southwest of the station will include limnological investigations of a deep-water lake for comparison with earlier studies on shallow lakes, and monitoring of snowy owl and snow goose nesting.

The major project away from the station will be the investigation of the ivory gull nesting colony near the north coast of Bathurst Island.

### Palaeontology Division

#### Responsibilities

To collect Pleistocene vertebrate material from the Yukon and to describe and catalogue it in an attempt to reconstruct the vertebrate history of the region during the ice age.

#### Long-term Plans

To continue field work on Pleistocene vertebrates in the Yukon Territory, specifically in the vicinities of Dawson City and Old Crow River, until good representative collections have been established. Emphasis may be shifted later to the Yukon Coast or Northwest Territories.

### Review of 1973-74 Operations

From June 29 to August 12 large Pleistocene mammal and many microvertebrate remains (fish, bird and rodent) were collected in the Old Crow Basin, Yukon Territory. Many ice age mammal specimens were collected from deposits near Dawson City from August 12-23.

#### Plans for 1974-75

Plans involve collection of Pleistocene vertebrate fossils in the Dawson City area from August 16-22.

## NATIONAL MUSEUM OF MAN

### Ethnology Division

#### Responsibilities

To document the cultural heritage of the native peoples of Canada, including research, material collection, and analysis and dissemination of information on the social, linguistic and material culture of the Indians and Inuit of the Yukon Territory and the Northwest Territories.

### Long-term Plans

To conduct field and archival research on the cultures of northern indigenous peoples. Staff members direct the work, but much of it is done under contract by outside personnel. One aim is to involve more Indians and Inuit in the documentation of their own cultural heritage so they can then use the material to teach their own cultural history.

### Review of 1973-74 Operations

#### Inuit Research

One officer of the Ethnology Division conducted research in the North: Dr. David W. Zimmerly carried out a variety of ethnological projects in Rankin Inlet, Coral Harbour and Broughton Island, N.W.T. The following studies were made by outside workers under the Division's Urgent Ethnology contract program:

Compilation of a grammar and dictionary of the Cumberland Peninsula Inuit, Baffin Island, N.W.T. — Ken Harper

Effects of acculturation on the Inuit music of Cumberland Peninsula, Baffin Island, N.W.T. — Majia Lutz

The Davis Strait Whale Fishery 1820-1860 — W. Gillies Ross.

Iglulik Inuit string figures and Pond Inlet kayak reconstruction, — G. Mary-Rouseliere

Contemporary music of the Coppermine Inuit. — Dr. Doreen Binnington

Cultural ecology of the Inuit of Clyde River, N.W.T. — George Wenzel

Collection, transcription and translation of Inuit life-history material and myths. — Ann Hanson

### Plans for 1974-75

#### Inuit Research

Staff ethnologist Dr. David W. Zimmerly will conduct research on language and modern hunting techniques at Rankin Inlet and at Broughton Island, N.W.T.

The following projects are planned for completion by outside Urgent Ethnology contract personnel:

Trading alliances and partnerships of the West Hudson Bay Inuit. — Dr. Lee Guemple

The implications of caribou hunting economy on ecological, biological and

social adaptations of Caribou Inuit. — — Cheryl L. Acker.

Study of the Inuit photo collection in the National Museum in Copenhagen, Denmark. — — Margaret Stott

Derivational process in the Itivimuit Inuit dialect of Nouveau Québec. — — Dr. Dermot-Ronan F. Collis

Traditional kayaks and their construction techniques. — — Eugene Y. Arima

The cultural basis of Inuit social relations. — — Joseph Maxwell

The study and reconstruction of an Inuit qarmaq (semi-subterranean house) in Igloodik, N.W.T. — — Symond Allard

Lexicological study of the Inuit language. — — Jean-Pierre Paillet

### Review of 1973-74 Operations

#### *Athapaskan Research*

Staff ethnologist A. McFadyen Clark continued research on settlement pattern and oral tradition of the Koyukon Athapaskan; and, in conjunction with the Communications Division, National Museum of Man, conducted research for and developed a joint National Museum of Man/Royal Scottish Museum International Travelling Athapaskan Exhibition. Additional research was conducted by contract ethnologists as follows:

Collection of oral tradition and continuation of a linguistics study of Algatcho Carrier and Chilcotin by two contractors in the region between Anahim Lake and Bella Coola, B.C. — — Benny Jack and Clark Davis.

Continuation of a linguistics and oral tradition study of Kutchin in and about Ft. McPherson, N.W.T. — — Dr. John T. Ritter.

Continuation of a study of contact-traditional socio-political organization and warfare among the Tagish Inland Tlingit and Tutchone of the Yukon Territory — — Dr. Catharine McClellan.

Contact-traditional culture research centering on the period 1880-1910 among the Northern Tutchone of the Yukon Territory. — — Dominique Legros.

Collection and processing of Athapaskan myth and legend from elderly patients in hospital in Saskatchewan, the Yukon and the Northwest Territories. — — Dr. Anna B. Rooth.

### Plans for 1974-75

#### *Athapaskan Research*

Staff ethnologist A. McFadyen Clark will conduct a survey of Athapaskan communities of the Yukon and Northwest Territories to determine their potential for future traditional culture research and will initiate an investigation of the interface phenomena between Inuit and Indians of the Yukon and Northwest Territories.

The following field projects are planned for completion by contract ethnologists through the Ethnology Division Urgent Ethnology Program:

Continuation of an oral tradition and linguistic study of Kutchin in the Arctic Red River-Ft. McPherson region of the Northwest Territories. — — Dr. John T. Ritter

Continuation of a comparative study of Tagish, Inland Tlingit and Southern Tutchone culture in the Yukon Territory. — — Dr. Catharine McClellan

Continuation of a study of Northern Tutchone Ethnography and culture change. — — Dominique Legros

Initiation of a comparative study of syntax of Central Mackenzie River Athapaskan groups. — — Dr. Robert Howren.

Initiation of an ethnolinguistics study of the hand game and collection of riddles and life histories of Mackenzie River Athapaskans. — — Drs. Keith & Ellen Basso

Initiation of a study of ritual practices and religious life of the Athapaskans at Ross River, Yukon Territory. — — Mr. R. McDonnell

Initiation of a linguistics study of Hagwilgate Carrier. — — Mr. Jim Kari

Initiation of a study of the nature, extent, and causality of cognitive sharing and diversity among the Slavey at Ft. Liard, Ft. Simpson, and Ft. Nelson. — — Drs. Peter Gardner, June Christian, and Marshall Durbin

Initiation of a study of Hare grammar at Fort Good Hope, Northwest Territories. — — Miss Keren Rice

Initiation of a study of porcupine quill technology among the Athapaskans at Fort Providence and other regions about Great Slave Lake. — — Mr. Robin Odle

### *Archaeological Survey of Canada*

#### **Responsibilities**

To undertake research on the prehistory of Canada's native peoples.

### **Review of 1973-74 Operations**

#### **Staff projects**

##### *Bryan Gordon, Arctic archaeologist*

A week, August 4 — 11, of brief field examination was carried out on the middle Back River, northern Barrenlands. Field survey was accomplished through low altitude aircraft reconnaissance and a two-man kayak. Aerial survey was limited to the area between the junction of the Bailey and Back Rivers (western boundary of the Thelon Game Sanctuary) and the McKinley and Back River confluence, in addition to the flat glaciated region between the major lakes of the Back and Thelon River Systems. Exploration by boat and on foot was conducted between McKinley River and the abandoned R.C. mission on Upper Garry Lake, a journey of approximately 75 miles. While aerial reconnaissance was oriented chiefly toward inukshuks and the worn paths of migratory caribou on eskers, open tundra and sand deposits, foot survey permitted detailed examination of habitation, hunting, burial and workshop sites. Fifteen sites were located of which seven were habitation sites usually with tent rings, four were sites involving caribou hunting activities, one was a burial site and two were workshops. The remaining site was a combination hunting and habitation site. Habitation sites are estimated to date in the Christian era.

##### *Richard E. Morlan, Yukon archaeologist*

The field season of 1973 was devoted to major expansion of the Gladstone site collection. The site is located on the east shore of Kluane Lake, in southwest Yukon Territory, and is one of the major stratified sites on which MacNeish (1964) based his synthesis of the prehistory of the region. This marks the first of several years of field and laboratory work designed to re-evaluate and to broaden our knowledge of southwest Yukon pre-history, and the Gladstone site was chosen as a starting point because of its central position in MacNeish's definition of the so-called Northwest Microblade Tradition.

Between mid-June and early August a crew of nine succeeded in excavating 31 two-metre squares through a 1.2 metre profile of



stratified loess and sandy loam deposits on the main Gladstone site (JhVq-1). In addition a long trench was excavated on the High luff site (JhVq-2) which was finally abandoned because of gale force winds and badly disturbed stratigraphic contexts. A more recent pot-ash occupation was recovered from a small site (JiVq-2) further north along the Kluane Lake bluffs. Several other small sites were located in the vicinity during brief exploratory forays from the base camp.

#### *James V. Wright, Head, Research Section*

During August, 1973 Dr. Wright directed the excavation of the Grant Lake site (KkLn-2) on the Dubawnt drainage system, Keewatin District (Harp 1961). This excavation was very successful and produced more than 400 Agate Basin artifacts from discrete living floor areas within somewhat scattered vent rings. Only two non-Palaeo-Indian artifacts were recovered. Radiocarbon and botanical samples were obtained and should provide age estimates for the site as well as a basis for a partial reconstruction of the environment. In addition to projectile points, scrapers and knives, the site produced chipped and ground adzes, circular lithos, bifacially flaked wedges, flake knives and serrated edge scrapers or saws.

Test excavations during the last week at another site further downstream revealed a series of living floors stratified by sterile water-deposited layers of sand and clay-silt. This sequence, consisting of a minimum of seven occupation levels, appears to run from early to late as follows: Agate Basin, late Field Archaic, ASTT, and temporal segments of the Taltheilei Shale Tradition. As a bonus, most of the living floors are rich in charcoal and a series of samples has been submitted for radiocarbon dating and, eventually, for botanical analysis. It is planned that Bryan Gordon will excavate this site next summer.

#### **Rescue Archaeology-Contract Supported Projects**

##### *W. T.*

Preliminary assessment of the Mackenzie Valley Pipeline Corridor, carried out by Jacques Cinq-Mars, with the assistance of Paul Donahue and Tim Losey. This was a continuation of a study inaugurated in 1972-73, supported by funds from the Environmental-Social Programme, Northern Pipelines.

##### *W. T.*

Survey and excavation on islands in Diana Bay, Hudson Strait, carried out by Patrick

Plumet, Laboratoire d'Archéologie, Université du Québec à Montréal. Salvage of Dorset and preDorset sites was made necessary by oil exploration activities and site looting by tourists.

Survey and excavation in the Cumberland Sound area of Baffin Island, conducted by Peter Schledermann, University of Calgary. Mining of Thule sites for whalebone to support the Pangnirtung carving industry has resulted in massive site destruction in this area.

Archaeological survey in Boothia Peninsula, carried out by Brian Yorga, McMaster University, in conjunction with the Cooperative at Spence Bay. Mining of whalebone for the Spence Bay carving industry made this project necessary.

#### **Plans for 1974-75**

Bryan Gordon plans to excavate several stratified sites in the southern Keewatin District containing Palaeo-Indian to late prehistoric remains.

James V. Wright, Donald Clark and Richard Morlan will complete the analysis in Ottawa of material from the North excavated previously.

Rescue archaeology will continue on the Mackenzie Highway and Pipelines projects and the Dempster Highway. Other rescue archaeology projects are now in the planning stage.

## NATIONAL RESEARCH COUNCIL OF CANADA (NRC)

### Responsibilities

Investigations into various phases of pure and applied sciences in northern Canada.

### Long-term Plans

Several divisions of the National Research Council have a continuing interest in the North.

The Division of Physics is involved in studies of space radiation from stations in northern Canada; these studies include ground based cosmic ray observations and rocket measurements of charged particles in the earth's magnetosphere.

The Division of Building Research conducts studies of permafrost, snow and ice and northern building problems.

The Radio and Electrical Engineering division carries out studies of the aurora, airglow, and other phenomena occurring in the upper atmosphere. These studies employ radio, optical, and plasma measurements, with observations made by ground-based and rocket-borne instrumentation.

The Space Research Facilities Branch operates the Churchill Research Range, the Great Whale Geophysical Station, a launching facility at Resolute Bay, and coordinates scientific programs conducted at these and other locations in Canada.

Other divisions of the National Research Council become involved periodically with northern work on a short-term basis. For example, the Ship and Marine Dynamics Laboratory of the Division of Mechanical Engineering is concerned with the design and development of ice breakers and the general ice environment as it affects northern shipping operations. This laboratory has been extending the knowledge of the resistance of ships in ice to the design considerations for installed power and has been providing consulting advice. In addition,

continuing activities within the Division of Chemistry are of significance to northern development. Reports in the Russian literature indicate that much of the natural gas in their northern latitudes is found in the hydrate or caged form. Although little unclassified information is available on the Canadian situation, considerable data has been obtained in the Division's laboratories on the nature and properties of hydrocarbon gas hydrates. Also, the use of special sedimentation equipment in series with diamond drilling operations in Canadian permafrost areas has substantially reduced the amount of imported antifreeze required for drilling fluids.

### Review of 1973-74 Operations

#### *Division of Physics*

Continuous monitoring of cosmic ray intensities was carried out at three stations in northern Canada (Alert, Inuvik and Goose Bay). This work is part of an international program based on a world wide network of cosmic ray monitoring stations. As a result of a review of the cosmic ray monitoring program carried out in 1972, stations at Resolute Bay and at Fort Churchill have been closed down and the Physics Division of NRC has taken over complete operation of the three remaining northern stations.

During 1972 a number of experiments were flown on rockets from Fort Churchill in a continuing study of the charged particles responsible for aurora and other geophysical effects. Considerable effort has gone into developing a new technique for measuring DC electric fields in the earth's magnetosphere.

#### *Division of Building Research*

Measurements of permafrost temperatures at sites on Devon Island in the arctic

archipelago and at Yellowknife were terminated after 1 1/2 and four years, respectively. Ground temperature observations were continued at 12 sites on mountain summits in British Columbia and four sites at Rankin Inlet, N.W.T. and were initiated at two sites on Melville Peninsula and four sites at Churchill, Manitoba where cables were installed during 1973.

The division continued to operate a small field station at Thompson, Manitoba to provide support for the various engineering and terrain studies of permafrost being carried out in northern Manitoba. Investigations to determine the effects of various microclimate and terrain factors on the distribution of permafrost were continued at several Thompson test sites. Measurements of frost heave forces and heat conduction on nine steel piles installed at Thompson in 1972 were continued. In cooperation with Manitoba Hydro, studies of dykes constructed on thawing permafrost at the Kelsey and Kettle Generating Stations were continued and were initiated at the next hydro site (Long Spruce Generating Station) now under development on the Nelson River.

Evaluation of the performance of insulated embankment test sections constructed in 1972 on the Mackenzie Highway just south of Inuvik, N.W.T. was continued. Observations, begun some years ago, to assess the long-term performance of various structures including the airstrip and buildings at Inuvik were continued.

Laboratory investigations to determine the thermal conductivities of various fine grained soils from the Mackenzie River Valley were undertaken and completed at the request of the Mackenzie Highway Environmental Working Group. Studies were initiated in the laboratory on the short and

long term (creep) properties of frozen soils. The latest U.S.S.R. code for foundations on permafrost was translated and will be published by NRC.

Attention continues to be given to the determination of the maximum force that ice can exert on structures. Laboratory studies were undertaken to establish, for the edge-loading of ice plates, the dependence of maximum load on the ratio of the width of the loading surface to the thickness of the ice, and to determine the strain rate and temperature dependence of Young's modulus of various types of ice. Devices for measuring *in situ* stresses and strains in ice covers were successfully tested in the field. Measurements are being made of uplift forces exerted by ice on piles due to a change in water level.

The Division, on behalf of the Department of Indian and Northern Affairs, carried out a detailed engineering analysis of an ice platform specially constructed to support an offshore drilling project near Melville Island, and subsequently has been involved in monitoring the performance of the ice platform.

Advice and assistance on northern building and geotechnical problems was provided by the Division to a number of industrial firms and government departments and agencies.

#### *Radio and Electrical Engineering Division*

Ground-based spectrometric and photometric observations of auroral and airglow emissions in the ultraviolet, visible, and infrared regions of the spectrum were made from Fort Churchill and from Gillam, Manitoba. The data are being correlated with other data gathered by rockets launched from Churchill, and from space-raft.

Plasma probes were flown on seven auroral rockets launched at Churchill, and photometers were flown on two of these. In addition, one rocket was instrumented and flown for the collection of cosmic dust in the upper atmosphere.

Auroral radar equipments were operated continuously at Poste-de-la-Baleine (Great Whale River), P.Q., and at Churchill and Thompson, Manitoba.

Auroral all-sky cameras were in operation at Poste-de-la-Baleine, P.Q., Moosonee, Ontario, and Churchill, Manitoba.

#### *Space Research Facilities Branch*

Through its Space Research Facilities Branch, NRC continued to operate the

Churchill Research Range (CRR) during 1973. Programs included the launching of scientific sounding rockets and balloons to investigate geophysical phenomena in the upper atmosphere on behalf of scientists from Canada, the United States and other countries. Associated ground based experiments were also carried out by scientists from various universities participating in these programs.

Recent observations from several spacecraft have stimulated considerable scientific interest in the dayside aurora which occurs in the northern hemisphere. Six Canadian scientists have submitted proposals for the study of the dayside ionosphere in the polar cusp region using two Black Brant rockets. These proposals have been approved by the Canadian Sounding Rocket Planning Group. The Branch has carried out a study to select a suitable launch site for this project. The DEW Line Station at Cape Parry has been selected because it offers the best compromise between logistics and scientific requirements. Detailed planning for the establishment of a temporary rocket launch site at Cape Parry is now in progress.

#### *National Aeronautical Establishment*

At the request of the Department of Energy, Mines and Resources aeromagnetic surveys were made in Davis Strait and Baffin Bay between latitudes 62°N and 72°N, to supplement surveys carried out in 1964, 1966 and 1967 to map the magnetic anomalies occurring in those areas, to determine their orientation and magnitude and the evidence which they provide with regard to continental drift.

#### *Plans for 1974-75*

##### *Division of Physics*

It is planned to continue both the cosmic ray monitoring program and the rocket program at about the same level as in 1973. Although some rocket experiments are planned for Fort Churchill the main effort will go into experiments to be flown from Cape Parry, N.W.T., to investigate the dayside cusp region of the earth's magnetosphere.

##### *Division of Building Research*

Cables will be installed and ground temperature observations begun at Eskimo Point, Baker Lake and two other locations in the western part of the Keewatin District. A site will be selected in south western British Columbia for detailed investigations of alpine permafrost and, in cooperation with

the University of Calgary, studies of permafrost distribution will be undertaken in the mountains of south western Alberta. Microclimate and terrain studies of permafrost at Thompson and measurement of ground temperatures at Rankin Inlet, Churchill, Melville Peninsula and mountain summits in British Columbia will be continued.

Wood piles will be installed as part of the continuing program to measure frost heave on foundations at Thompson, Manitoba. The study of insulated roadways on permafrost on the Mackenzie Highway will be continued. Evaluation of the performance of various engineering structures and facilities on permafrost at Inuvik, Thompson and Gillam, Manitoba will be continued. Further development of equipment and procedures and studies for the measurement of the strength and thermal properties of frozen soils in the field and in the laboratory will be undertaken.

Consideration is being given to conducting field tests to better define the long term load bearing capacity of ice covers and to measure *in situ* stresses and strains in ice covers at sites where significant pressures occur. Investigations on uplift forces exerted by ice on piles due to change in water level will be continued.

#### *Radio and Electrical Engineering Division*

Routine use of instruments for the observation of aurora and airglow will continue at Poste-de-la-Baleine, Churchill, and Moosonee. Auroral and airglow observations in the ultraviolet, visible, and infrared regions of the spectrum will be made during selected periods of the winter of 1974-75 from Churchill and from Gillam, Manitoba.

The network of auroral radars will continue in operation at Churchill, Thompson, and Great Whale.

Plasma probe rocket experiments will be carried on two rockets to be launched from Cape Parry, on the Beaufort Sea. Rockets carrying photometers and cosmic dust collectors will be launched from Churchill.

#### *Space Research Facilities Branch*

Operation of the Churchill Research Range will be continued for the launching of scientific sounding rockets and balloons to investigate geophysical phenomena in the earth's atmosphere and in space on behalf of scientists from Canada, the United States and other countries. In December 1974, two Black Brant rockets will be launched from a temporary launch site which will be established at the Cape Parry DEW Line Station.



This will be the first time that the larger Black Brant rockets will be launched from a temporary launch site in the Arctic region. This operation will be fully coordinated with the Department of National Defence as well as with other government departments concerned with operations in the North.

The Great Whale Geophysical Station will continue the work of auroral photography and photometry and making a variety of radio frequency measurements for Canadian and U.S. agencies.

#### *National Aeronautical Establishment*

The aeromagnetic surveys in Davis Strait and Baffin Bay will be continued during the spring of 1974 for the Department of Energy, Mines and Resources.

## NORTHERN CANADA POWER COMMISSION (NCPCC)

### Responsibilities

To provide public utilities in the Yukon and Northwest Territories as authorized by the Governor-in-Council. To operate plants from consumer revenue on a self-sustaining basis including repayment of capital expenditures.

### Long-term Plans

To provide optimum service, the Commission will continue to monitor the increasing energy demands of the North and conduct investigation and engineering studies to ensure that demands are met in the most suitable manner. The Commission will utilize available expertise to design and implement projects which are economical in terms of cost and in keeping with the environment in which they are situated, so as to serve best the interests of all the Northern people.

### Review of 1973-74 Operations

Gross generation of electrical energy in the North during the year approximated 550 million KWH, an increase of eight per cent over the previous year's output. Eighty-three per cent of the output was generated by hydro plants at Whitehorse and Mayo in the Yukon and at the Snare River and Taltson in the Northwest Territories. Of the total electricity generated the Northwest Territories accounted for 57 per cent and the Yukon 43 per cent.

During the year the Commission commenced construction on the Aishihik River hydro project, which on completion in 1974 will add 30 megawatts to the Whitehorse hydro transmission system. A diesel-electric generating plant was commissioned at Tulatuk and electrical energy was provided to the residents of this area of the Northwest Territories in December 1973.

In order to meet increased demand and to upgrade electrical service, additional generating capacity was completed, or installations commenced, at Cambridge Bay, Cape Dorset, Clyde, Coral Harbour, Eskimo Point, Fort Good Hope, Fort Liard, Fort Smith, Hall Beach, Igloodik, Inuvik, Lake Harbour, Nahanni Butte, Pangnirtung, Spence Bay, Yellowknife and Tuktoyaktuk in the Northwest Territories and at Whitehorse in the Yukon Territory. Extensions and improvements to power facilities, distribution systems and employees' accommodation were carried out at a number of plant locations.

In August 1973, the Commission completed the move of its head office from Ottawa to Edmonton, Alberta. The new location has served to improve communications with the Territorial governments, our Regional offices, and major customers and suppliers.

During the year, investigations continued to determine potential sources of hydro power to meet the future energy demands of the North. In the Northwest Territories, application was made for a licence to develop additional hydro on the Snare River. The proposed Snare Forks plant will be connected to the existing transmission line to Yellowknife and will add an estimated 14 megawatts to the system.

### Plans for 1974-75

In 1974-75, the Commission will complete the Aishihik hydro project and will start construction of the Snare Forks Hydro Plant. Arrangements have been made to take over plants now operated by the Government of the Northwest Territories at Arctic Bay, Grise Fiord, Lac La Martre, Pond Inlet, Port Burwell and to transfer the Resolute plant from the Ministry of Transport. Plans

also provide for the construction of diesel-electrical power facilities at Rae Lakes, Northwest Territories and for extensions and improvements at existing plant locations to upgrade service and to meet forecast load requirements.

## NORTHERN TRANSPORTATION COMPANY LIMITED (NTCL)

### Responsibilities

Northern Transportation Company Limited has operated throughout the Mackenzie River system and the western arctic coast for over 40 years. The company's marine operations have been the principal transportation lifeline serving general community freighting needs and providing logistic support for oil, gas and mineral exploration and development. Since 1944, N.T.C.L. has transported in excess of four million tons of freight over its 4,800 mile system. The company operates a fleet of three ocean-going ships, 28 diesel tugs and 167 all-steel, dual-purpose barges with capacities of up to 1,500 tons, providing an aggregate gross tonnage of 91,000 tons. During the normal May to October navigational season, N.T.C.L. employs more than 950 persons, many of whom are residents of the region it serves.

### Review of 1973-74 Operations

In contrast to last year N.T.C.L. encountered a rather disappointing year in 1973 with total traffic handled (which in 1972 amounted to 398,641 tons) falling to 327,904 tons, a decrease of 17.75 per cent. Among the factors which contributed to this situation were continuing delays in the initiation of construction of the Alyeska pipeline, substantial overstocking of supplies by oil exploration companies during the preceding year, an abnormally mild winter which impeded exploration drilling, broad concern over the protection of native rights resulting in the judicial caveat regarding transfers of land title, and a reduction of about 25 per cent in the number of exploration wells drilled in the Mackenzie Delta. Along with a reduction in community resupply traffic of only 0.16 per cent under

1972, the volume of oil exploration traffic registered a decrease of 41.47 per cent. During the course of the 1973 operating season, once it became apparent to N.T.C.L. that a reduction in business was materializing, the Company's capital expenditure program was cut back to the utmost extent practicable. In planning for marine capacity expansion, however, the Company generally regards it as being more prudent to incur the risk of ownership of excess capacity than to incur any significant risk of insufficient capacity with the attendant consequences for the users of the service.

During 1973, some \$31,000,000 was expended by N.T.C.L. in connection with fleet expansion and the enlargement and improvement of shore-based facilities and equipment. Among the larger items included in this program were four 4,500-h.p. tugs, twenty all-steel 1,500-ton capacity barges, 500 containers with ancillary lifting equipment, and a new marine maintenance building at Hay River equipped to handle the Company's largest vessels. The additional floating units were built in Vancouver and, in a departure from the practice of former years when such equipment was broken down for re-assembly at Hay River, were moved to the Mackenzie River via the west coast of Canada, the Gulf of Alaska, and around Point Barrow through the Beaufort Sea to Tuktoyaktuk. The 3,800 mile delivery voyage lasted 23 days and was accomplished ahead of schedule without incident.

In the course of the year, the "Voyageur" air cushion vehicle evaluation program being undertaken by the Company for the Ministry of Transport was successfully carried out through all phases, including a river transit from Tuktoyaktuk to Fort Simpson over ice. Early in 1973, N.T.C.L. acquired two used

British SR.N6 air cushion vehicles along with a substantial inventory of spare parts. Following a refurbishing program the first craft was placed in operation under contract to Imperial Oil in the Mackenzie Delta and Beaufort Sea in mid-August, and it successfully carried out personnel transport, resupply and safety standby services during drilling operations at an offshore site.

### Plans for 1974-75

In consideration of an anticipated traffic volume for 1974 similar to that experienced in 1973, the N.T.C.L. capital expenditure program for 1974 has been confined to projects and items without which the Company's posture of readiness to cope with the challenges lying ahead would be jeopardized. The Mackenzie program includes completion of several on-shore construction projects and equipment purchase programs begun in 1973, along with the replacement of, and additions to, units of mobile, maintenance and oil-handling equipment. The program also provides for land acquisition and construction of a new freight terminal and maintenance facility at Edmonton, and for the replacement of, and additions to, highway fleet equipment for the Company's trucking subsidiary.

The Company plans on having its second SR.N6 air cushion vehicle fully modified and ready for operation in May of 1974. This craft will be of the flat-deck configuration, thereby affording it a greater degree of flexibility in respect of bulky and low density cargo, and its "lift-on/lift-off" passenger module should make it highly suitable for a wide range of freighting and passenger applications. It is anticipated that both of the Company's ACV's will be employed in 1974 for site servicing and seismic work.



Pursuant to a directive from the Minister of Transport, in order to honour a Federal Government commitment arising from the Western Economic Opportunities Conference of July 1973, N.T.C.L. will be implementing in 1974 the initial stage of a \$7,500,000 capital expenditure program for one triple-screw tug and four barges and miscellaneous materials-handling equipment to initiate an ex-Churchill Keewatin resupply service in 1975. The floating equipment for this operation is being built on the West coast and delivery at Churchill, via the Panama canal, is scheduled to occur in late September of 1974.

## POST OFFICE DEPARTMENT

### Responsibilities

Provision of mail service to and from post offices in the Yukon and Northwest Territories.

### Review of 1973-74 Operations

During the past year, a new post office, Sanikiluaq, was opened at Belcher Bay, N.W.T. Facilities were enlarged or improved at Inuvik, N.W.T. and at Whitehorse & Carmacks, Y.T.

In order to improve service in the North, a new position of area manager has been created for the Eastern Arctic, based on Val d'Or. Since the establishment of this position, many problems have been corrected and service has been improved.

### Plans for 1974-75

It is planned to establish another postal area in the Northwest Territories to improve Post Office services. The frequency of several transportation services will be increased and helicopter service will be provided for certain offices isolated during the freeze-up and thaw periods.

A new office is planned for Fort Georges, N.W.T. to improve service in this area. Its establishment will involve an expenditure of about \$20,000.

Letter carrier service will be extended to the Porter Creek & Crestview areas, just north of Whitehorse, Y.T.

### Long-term Plans

To provide adequate mail service subject to the availability of transportation services, at an equitable cost.

## ROYAL CANADIAN MOUNTED POLICE (RCMP)

### Responsibilities

The Royal Canadian Mounted Police is responsible for policing the Yukon and Northwest Territories. The basic responsibility of the Force is to preserve peace and maintain law and order, which includes the enforcement of Federal Statutes and Territorial Ordinances.

### Review of 1973-74 Operations

Beaver Creek, Y.T., which formerly operated only as a summer detachment, was opened on January 17, 1974, and will operate on a trial basis for one year at which time an assessment will be made as to the need for a permanent detachment. A patrol bin (trailer) was relocated at Beaver Creek to facilitate opening of the detachment.

A new airport detail was established at Whitehorse, Y.T. to be staffed by one regular constable and six special constables.

A Customs and Excise section at Whitehorse, General Investigation Squad sections in Inuvik and Yellowknife and drug sections at Whitehorse and Yellowknife were established to cope with the elements of sophisticated crime.

A workshop-warehouse-garage combination building, a cell cabin and married quarters detachment building were erected at Norman Wells Detachment.

A workshop-warehouse-garage combination building was erected at Pond Inlet Detachment to replace the building destroyed by fire.

A cell cabin was set up at Fort Simpson Detachment.

An "Air" detachment hangar was erected at Frobisher Bay.

New married quarters were erected at Port Liard and Fort Providence Detachments.

Renovations were made to the R.C.M.P. Building at Inuvik to accommodate a new identification section.

This year (1973) being the Force's centennial a number of projects were undertaken, which included "Open House" at various detachments providing the public an opportunity to visit them and gain an insight of our operations.

Amongst the many events that took place, the highlights involved the dedication of a plaque and cairn at Fort Constantine (Old townsite of Fortymile, Y.T.) to commemorate the establishment of our first post in the Yukon Territory; the dedication of a plaque and cairn at Pasley Bay in honour of Supt. H.A. Larsen and the R.C.M.P. Schooner "*St. Roch*"; the dedication of a plaque at Yellowknife, N.W.T. to commemorate the dog sled era in the North; and a river patrol down the Yukon River following the route of the gold seekers to the Klondike.

### Plans for 1974-75

Renovation to the existing building at Yellowknife and addition of an administrative wing to accommodate the "G" Division Headquarters staff relocated from Ottawa.

Construction of a building at Whitehorse to accommodate a division headquarters and a detachment, highway patrol and other sections.

Delivery and siting of a second cell cabin at Fort Simpson.

Delivery and siting of a cell cabin at Fort Good Hope.

Delivery and siting of a detachment quarters/office building, garage-workshop-warehouse building and cell cabin at Clyde River to accommodate the detachment relocated from Cape Christian.

Delivery and siting of a cell cabin at Cape Dorset Detachment.

To intensify our training programme (including native special constables) to produce better qualified policemen, knowledgeable in new methods and techniques.

To strengthen and maintain good police-community relations by producing and developing preventive policing programs with emphasis on recruiting more native people.

### Long Term Plans

Development of the North continues to be a major factor and the thrust of activities have a significant effect on our planning process. Consequently our long term plans are continually under review to provide additional detachments and manpower to meet requirements for adequate police protection.



TRANSPORT CANADA (MOT)

ARCTIC TRANSPORTATION AGENCY

The Arctic Transportation Agency determines and controls development of the transportation infrastructure in the Territories which comes under the Ministry of Transport. The Agency aims to provide transportation systems which will contribute to the achievement of the national objectives for northern Canada. To do this most effectively, it is necessary to continually assess the alternate uses to which the limited transportation resources may be put, and to establish priorities.

Co-ordination and consultation with the Territorial Governments, industry and other organizations, is essential. The Agency is involved in formulating the plan for transportation systems in the Territories, including the air and marine modes as well as the use of road, rail, pipeline, hovercraft and other facilities so as to ensure appropriate and improved inter-modal services in the North. Co-ordination with other government departments and agencies is carried out through the Advisory Committee on Northern Development and the Task Force on Northern Oil Development. The role of Transport Canada and the activities of these committees is centred in the Arctic Transportation Agency, and its Administrator is chairman of their respective transportation sub-committees.

The Agency continues to accelerate development of the projects which will satisfy the growing needs resulting from changing requirements in the North.

The Arctic Transportation Agency office in Yellowknife, N.W.T. was established in order to have close contact with Territorial Government and organizations in the North. It responds to various requests for assistance and support concerning the MOT's role in the Arctic.

The Ministry of Transport program for the Territories, which is implemented by the appropriate administrations in the Ministry, and other agencies which have the technical and operational responsibilities, involves expenditures of approximately \$30,000,000 a year and revenues of approximately \$7,000,000.

In addition to the primary modes of transportation, i.e., air and marine, the Agency is also involved in analyzing and developing road, rail, pipeline, hovercraft and other facilities in order to ensure effective and efficient multi-modal transportation services in the North.

An inter-modal study will be undertaken to examine transportation in the north on an integrated basis which should result in the optimum use of all modes, and ensure that future government programs will reflect the mix of modes which will provide the greatest benefits to the northern residents. In view of recent developments, the Agency is accelerating the projects which will satisfy the growing needs resulting from the changing requirements. To this end, the capital funding has been almost doubled each year since 1972.

Air

A major achievement of the Arctic Transportation Agency was the development of an air facilities policy, the basis of which is the establishment of standards and an implementation program for air transportation facilities. Cabinet approval of this new policy has been received. Fundamental to the new policy is the classification of arctic airports into A, B and C categories, according to various criteria such as size of the community, traffic demand and degree of isolation.

The B and C categories are community airports, and cabinet approval included a five-year program during which time the Ministry would spend over \$40 million to bring these airports to minimum standards embodied in the policy. The eleven 'A' airports, including Yellowknife, Whitehorse and Resolute, have been operated by MOT for some time, and will be improved in accordance with traffic demands.

A study is now under way to formulate policies governing relationships between air carriers and route structures in the North, aimed at meeting the needs of people in much the same way as was done for southern Canada in the establishment of relationships and route structures between the trunk carriers (Air Canada and Canadian Pacific) and the five regional carriers.

In all these studies, whether completed, under way or contemplated, the Arctic Transportation Agency has made full use of the consultative approach, soliciting views of the carriers, other government departments, the public, boards of trade, transportation associations, territorial governments and, most important, the users themselves.

Marine

The Arctic Transportation Agency is working with the other government departments to improve the annual eastern Arctic resupply, on which remote communities in the North are so dependent. In this connection it has been decided that, beginning in 1975, six communities on the west coast of Hudson Bay in the Keewatin district will be resupplied by the Northern Transportation Company from a base at Churchill, Manitoba, using a tug-barge system. This is expected to prove of great benefit to the northern residents involved.

For the remainder of the eastern Arctic, the Arctic Transportation Agency, in consultation with other members of the Advisory Committee on Northern Development, is now working on a system through which contract awards for the resupply operation will be on a multi-year basis. This, also, should prove beneficial to the people served.

## CANADIAN AIR TRANSPORTATION ADMINISTRATION

Through two main directorates, (Airports and Construction, and Civil Aeronautics) provides safe and efficient facilities and services in support of air transportation.

## CIVIL AERONAUTICS

### Responsibilities

The Civil Aeronautics Directorate of the Canadian Air Transportation Administration, plans, co-ordinates and directs all activities relating to the control and orderly development of civil aeronautics in Canada. These activities include developing and enforcing legislation, standards and regulations through licensing and inspection; providing electronic and telecommunication services and systems in support of civil aeronautics and other administrations and departments; designating airspace and the operational control of aircraft, investigating aircraft accidents and doing research into the development of improved aviation systems; improving security; and providing government flight services.

### Long-term Plans

#### Communications

In support of northern aviation, transcribed weather broadcast systems are planned for Yellowknife, Inuvik and Cambridge Bay for 1975-76.

Station renovations including the installation of modular communication control equipment will take place at Sachs Harbour, Banks Island, N.W.T. in 1976-77.

A system will be installed in 1977-78 to permit Fort Resolution aeradio station to be remotely controlled from Hay River.

In 1979-80, aeradio stations will be established at the following northern locations:—

Hall Beach  
Rankin Inlet

In later years beyond 1980, aeradio stations are planned for:—

Arctic Bay  
Coppermine  
Eureka  
Little Cornwallis  
Rainbow Lake

A new remote receiver site is planned for Baker Lake during the period 1980 and beyond.

### Aids

Long term plans call for VOR/DME at Coral Harbour, Eskimo Point, Gjoa Haven, Hay River, Contwoyto Lake, Burwash, Fort Smith and Holman Island.

VHF/DF installations are planned (1975-78) for Resolute Bay, Coral Harbour, Watson Lake, Norman Wells, Fort Simpson, Fort McMurray, Hay River, Frobisher Bay, Baker Lake, Cambridge Bay.

The long term program calls for NDB installations at Ft. Macpherson, Ross River, Arctic Red River, Fort Liard, Ft. Norman, Lac la Martre, Lake Harbour, Port Burwell, Snowdrift and Tungsten.

Instrument Landing Systems will be programmed to upgrade certain major arctic airports in accordance with the recently approved northern facilities policy.

## Telecommunications and Electronics

### Review of 1973-74 Operations

#### Omega

A program of monitoring and recording propagation characteristics of Omega Navigation System signals is being conducted in northern and arctic regions. Monitors are being operated at four sites: Resolute, Coral Harbour, Frobisher Bay and Inuvik. Data obtained is used to improve correction tables and to determine the predictability of sporadic ionospheric disturbances, polar cap anomalies and other phenomena peculiar to northern and Arctic regions. The data is being collected in conjunction with the Omega navigation system and the proposed Global Rescue and Alarm Net.

#### Anik Satellite

Arrangements were made to extend the Atmospheric Environment Service Automated Teletype Network to Frobisher Bay and Resolute Bay via the Anik Domestic Telecommunications Satellite. The Air Services Automated Data Interchange System (ADIS) will be extended by the same

means to serve Frobisher Bay, Coral Harbour, Chesterfield Inlet, Baker Lake, and Resolute Bay.

## Aeronautical Communications

The conversion to compatible AM/SSB of the HF air-ground service on 5,680 KHz continued at our northern aeradio stations. HF single sideband is now available at 10 northern stations.

The mobile prefabricated aeradio station was completed for Tuktoyaktuk, N.W.T. This station takes over former DEW site commitments by providing air-ground and meteorological services on a 16 hour-per-day basis.

VHF/ATC installations controlled from Edmonton were installed at Hay River, Norman Wells, Yellowknife, and Whitehorse.

## Navigation Aid Facilities

ILS — A glide path installation was completed at Hay River to provide a full instrument landing system facility.

VOR/DME — VHF omni-ranges with distance measuring equipment (VOR/DME) were installed at Cambridge Bay, Resolute Bay, Whitehorse, Yellowknife and Inuvik. The Cambridge facility is commissioned, while the others are awaiting commissioning.

VHF/DF — VHF direction finding installations were completed at Whitehorse, Yellowknife and Inuvik.

NDB's — Non-directional radiobeacons (NDB's) were installed at Old Crow, Holman Island, Povungnituk, Pt. Radium, Saglek, Koartuk, and Inuvik (two terminal NDB's). Improvements were made to the Contwoyto NDB, where an increase in power to 1KW is scheduled for 1974-75.

## Plans for 1974-75

### Aeronautical Communications

VHF communication facilities will be added at many northern aeradio stations. Conversion to compatible AM/SSB will continue.

Modular communication control equipment will be installed at Fort Simpson.

Communication facilities will be rehabilitated at Clyde River, Baffin Island.

### Navigation Aid Facilities

VOR/DME's will be installed at Fort Simpson, Fort Good Hope, Wrigley, Norman Wells, Watson Lake and Frobisher Bay. Baker Lake and Hall Beach are also programmed for 1974-75 — but for VOR only. DME will be added in the future.

NDB's will be installed at Sanikiluaq and Slave Lake.

### Air Traffic Services

#### Review of 1973-74 Operations

Air traffic control continued to provide area control service for flights operating under instrument flight rules in the Arctic Control Area of Canada. This area extends basically from 72° North to the geographical north pole and at above flight level 290. The service provides protection and separation for commercial carriers operating between Europe and the Orient that stage through Alaska; also a service to domestic flights operating north/south into and out of the arctic islands. In support of this service, ATS operates a discrete telephone circuit from the Edmonton ACC to Cambridge Bay, NWT, with switching arrangements at this point into the Sondrestrom ACC in Greenland and with the Anchorage air route traffic control centre in Alaska.

In the Northern Control Area of Canada, area control service was provided for all flights operating above flight level 230. Flights which benefited from this service and were provided with separation were commercial and military operators, operating between Europe and western North America and between the Eastern Seaboard and Alaska.

Flight information service and alerting service for search and rescue purposes were provided to all known flights in northern Canada and the arctic region as was practicable since the total area was designated as a flight information region up to the geographical north pole.

In the low-level airspace controlled airways are designated from Yellowknife to Inuvik, along the Staging Route to Alaska, and from Goose Bay to Frobisher. North of 60° North control area extensions were provided at:

Fort Smith  
Hay River  
Yellowknife  
Fort Simpson  
Norman Wells

Inuvik  
Whitehorse  
Watson Lake  
Teslin  
Frobisher

Control zones for additional protection and improved service to the operators were provided at the following airports:

Fort Simpson  
Norman Wells  
Watson Lake

Positive control zones are available at:

Inuvik  
Yellowknife  
Whitehorse

Airport control towers remained in operation at Yellowknife, Inuvik and at Whitehorse.

Two air-transportable airport control towers were delivered to Edmonton for use in northern Canada, in order that ATS can meet sudden demands for airport control service at various locations.

Centre peripheral VHF facilities were available at Saglek, Fort Nelson, Whitehorse and Inuvik.

#### Plans for 1974-75

Commissioning of PAL's at Hay River, Yellowknife and Norman Wells early in 1974.

Designation of an arctic track system consisting of three tracks in the arctic control area to provide an improved service to international flights flying between Europe and Alaska.

The boundary between the northern and southern control areas will be moved to a line approximately through Inuvik, Yellowknife, Churchill, Frobisher, coincident with lowering the base of the southern control area to 18,000 ft. above sea level. As a result, area control upwards from 18,000 ft. will exist in the area of MacKenzie River west and over the Frobisher/Ungava area.

### AIRPORTS AND CONSTRUCTION SERVICES BRANCH

#### Responsibilities

##### *Airports and construction*

The Airports and Construction Directorate of the Canadian Air Transportation Administration plans and co-ordinates all

activities relating to airport operations, services and facilities. These activities include: the development of policies and guidelines regarding marketing, security and operation of airports; development of policies and standards for the planning, design, construction and maintenance of airport facilities, provision of financial and advisory assistance to community airports; provision of engineering and architectural support in respect of off-airport CATA installations, to other elements of MOT, to CIDA and other federal organizations. The directorate is also responsible for all major construction and for providing design packages for projects undertaken by regional administrators.

#### Long-term Plans

To meet the future need for airports facility requirements consistent with the growth of air services in the Arctic.

#### *Airports and Construction Services*

#### Review of 1973-74 Operations

##### **Aklavik, NWT**

Completed site selection for a landing strip and access road.

##### **Cape Dorset, N.W.T.**

Provided advisory engineering service in connection with the construction of a 4,000 foot landing strip by DND.

##### **Eskimo Point, NWT**

Provided advisory engineering service in connection with the construction of a 4,200 foot landing strip by DND.

##### **Fort McPherson, NWT**

As part of the remote airport program MOT started construction of a 3,000 foot landing strip.

##### **Old Crow, Y.T.**

The landing strip was completed by the Yukon Territorial Government and MOT installed runway lighting.

##### **Pond Inlet, NWT**

Provided advisory engineering service in connection with the construction of a 4,000 foot landing strip by DND.

##### **Sachs Harbour, NWT**

Improvements started on the runway, taxiway and aircraft apron areas.

##### **Tuktoyaktuk, NWT**

MOT took over the airport operation from the USAF and extended the aircraft apron and improved the runway.



**Watson Lake, Y.T.**

Completed improvements to the air terminal building.

**Whale Cove, NWT**

Provided advisory engineering service in the completion of a 4,000 foot landing strip constructed by DND.

**Yellowknife, NWT**

Completed construction of the taxiway.

**Plans for 1974-75****Baker Lake, NWT**

Install VASIS at both ends of the runway and improvements to the runway are progressing on schedule.

**Cambridge Bay, NWT**

Plans are underway to stabilize the surface of the runway in support of jet aircraft service.

**Fort Simpson, NWT**

The paving of runway, taxiway and aircraft apron is scheduled for completion in 1975/76 at a total cost of \$2,161,000.

**Frobisher Bay, NWT**

Resurfacing of runway 18-36 and taxiway proposed at a total cost of \$1,800,000.

**Hay River, NWT**

High intensity approach lights to be installed.

**Inukjuik, NWT**

Conduct site selection and surveys for landing strip and access road.

**Inuvik, NWT**

The second phase of a commercial development is underway with construction of roads and ramp for aircraft cargo area.

**Jonas Inlet, NWT**

Provide advisory engineering service in connection with the construction of a 4,000 foot landing strip by DND.

**Resolute Bay, NWT**

Improvements to the fuel transfer lines and water system.

**Whitehorse, Y.T.**

Water and sewer lines to be replaced.

**CANADIAN MARINE TRANSPORTATION ADMINISTRATION****Marine Services****Responsibilities**

To carry out and co-ordinate the delivery of cargo and passengers for the Canadian

Government, USAF and Canadian commercial interest; to provide ice and routing information and, when necessary, provide icebreaker support for vessels navigating arctic waters and Hudson Bay; to carry out environmental research and surveys as requested by other government agencies; to install, operate and maintain marine aids to navigation; to assist with search and rescue operations; to administer the Navigable Waters Protection and Arctic Waters Pollution Prevention Acts.

**Long-term Plans**

To meet the growing requirements of Marine activity for icebreaker support in the Canadian Arctic, in the near future, tenders will be called for the construction of two heavy icebreakers with a capability equivalent to, or better than, CCGS *Norman McLeod Rogers*. The construction of these two heavy icebreakers will alleviate the situation in the Arctic during the summer months and the Great Lakes, and Gulf of St. Lawrence during the winter.

The Ministry of Transport has embarked on the design of an icebreaker which will significantly extend the season throughout the Arctic Archipelago and should provide a twelve month capability in Lancaster Sound as far west as Melville Island.

The Ministry plans to participate in the establishment of a VHF network on the Mackenzie River system in conjunction with other departments. This will provide a modern radio system for marine use as well as for the use of other Government agencies.

**Review of 1973-74 Operations**

During the 1973 navigation season the Ministry of Transport deployed five heavy and three medium displacement icebreakers to provide assistance to commercial ships operating in eastern arctic waters. Additionally two northern supply vessels, and CCGS *Narwhal* and CCGS *Sir William Alexander* were seconded for arctic operations.

CCGS *Narwhal* was formerly employed as a mobile stevedore depot; but because of changes in stevedore arrangements during the 1972 sealift, the ship was able to be employed on a hydrographic program in James Bay during the 1973 season. CCGS *Sir William Alexander* was engaged on a Defence Research Board project in the Arctic Archipelago.

Although the primary function of the Canadian Coast Guard icebreaking fleet was to ensure that icebreaker support was avail-

able to marine interests, CCGS *Louis S. St. Laurent*, CCGS *John A. Macdonald* and CCGS *d'Iberville* were on an opportunity basis engaged in hydrographic surveys as a supplement to their primary assignment. The surveys were to verify soundings obtaining during the previous winter through the ice, by the Canadian Hydrographic Service. These three ships obtained profiles of proposed pipeline routes and verified existing reconnaissance data. Furthermore they gathered data in various uncharted areas of the Arctic. Expanded sounding coverage was obtained in Victoria Strait by CCGS *John A. Macdonald*. This particular operation was undertaken in conjunction with CCGS *Camsell* which sails to the western arctic every summer from her base in Victoria, B.C.

One notable event was the support by units of the Canadian Coast Guard in loading the first cargo of 3,600 tons of lead and zinc concentrates to be shipped from the Canadian Arctic by commercial interests. The ore was loaded at Little Cornwallis Island by M/V *Helga Dan* with the assistance of CCGS *Louis S. St. Laurent* and CCGS *Labrador*. Further exploitation in this area is expected during the 1974-75 season.

Another operation worthy of note was the escort of a five-ship convoy into Eureka Sound by units of the Canadian Coast Guard fleet. This convoy provided the bulk of the logistic support for the intensive oil and gas exploration on Ellesmere Island and Axel Haiberg Island.

Two hundred and twelve ship movements were reported at the Ice Operations Office at Frobisher Bay, as opposed to 186 the previous year, an increase of 14 percent. Of these 212, approximately 30 percent were given continuous icebreaker support. The remainder were given intermittent icebreaker support and/or routing advice, by the MOT's Ice Operations Office at Frobisher Bay.

During the 1973 arctic resupply operation all cargo, with the exception of the bulk petroleum products which were delivered via two chartered tankers, was delivered on a commodity group basis. In addition to the CCG ships, approximately 20 commercial vessels were engaged. More than 60 northern settlements were serviced by all vessels which delivered approximately 64,052 short tons of cargo, comprising bulk petroleum products and dry cargo, of which 72 per cent was bulk petroleum products. The commodity group concept will be discontinued in 1974 and all dry cargo will be delivered on a weight/measurement basis.

More than 2,700 navigational aids were serviced and maintained in the eastern and western Arctic during the 1973-74 season. These included lighted and unlighted buoys, lighted and unlighted shore aids, racons, radio beacons and radar beacons.

#### Plans for 1974-75

A dual draft vessel to serve the coastal section of the Mackenzie Delta will be delivered in the late summer of 1974. A wharf will be constructed at Tuktoyaktuk to serve this vessel.

The CCGS *Wolfe* will be fitted with an improved bow section during the coming summer. The bow design is expected to materially improve the icebreaking performance of the vessel as shown by ice model basin tests carried out in 1969.

The Ministry expects that construction of additional buildings at the Hay River agency base will be completed in 1974.

### CANADIAN SURFACE TRANSPORTATION ADMINISTRATION

#### Railway Branch

During 1972, on behalf of the transport sub committee of the Advisory Committee on Northern Development, CN-CP Consultants undertook a study dealing with the feasibility and economics of an oil and gas railway from Prudhoe Bay to below the permafrost line, by way of the Mackenzie Valley. The Transportation Development Agency contracted for this study, and TDA's input to the annual report will include further information on this work.

Arrangements are proceeding to have two consulting studies undertaken with respect to railway planning for the Yukon. One of these would involve an assessment of a rail extension north from the present railhead at Whitehorse, while the other would contribute towards a longer range rail development strategy for the area. It is intended that both of these studies will be undertaken in the near future.

#### Highway Branch

The Highway Branch participated in continuing economic studies relating to the Mackenzie Highway and the problems of ferry crossings. With respect to the latter point, the task is to determine the most economic way of assuring maximum availability of service at river crossings. It has also participated in a number of the interdepartmental and intra-ministerial examination of highway facilities in the North, as well as

means of meeting the developing transportation demand.

On a more technical level, the Branch is funding an evaluation of the road insulation materials design to overcome the environmental problems of road construction in permafrost and high frost regions. A test section of insulated road has been built south of Inuvik and the heat flow behaviour is being monitored by continuous temperature recording at selected depth levels of the road base.

### TRANSPORTATION DEVELOPMENT AGENCY

#### Responsibilities

To provide leadership and direction to all sectors of transportation in Canada in the performance of research and development.

#### Long-term Plans

To identify, through research and development activities, technological and operational improvements to existing Canadian transportation systems, and requirements for new systems.

#### Review of 1973-74 Operations

##### Arctic Rail Study

This study was conducted to determine the engineering feasibility of construction and operations all year round, and the costs of rail transport of hydrocarbons along the Mackenzie valley from Prudhoe Bay and Atkinson Point to the southern limit of the permafrost. This will provide the data base for comparing the costs of transportation of hydrocarbons between the railway and the pipelines.

##### Transportation of Oil and Gas from the Arctic Islands

Studies of alternative systems for the transportation of oil and gas from the Canadian Arctic Islands have been made encompassing engineering feasibility, economic, environmental and industrial criteria. This study will also provide a model for evaluating future suggested methods (1980-2000).

##### Ice Formation and Characteristics Study

TDA participated with DOE, BRINCO and the Province of Newfoundland in ice research studies in Lake Melville. The object was to gather ice data and characteristics with the purpose of enlarging the data base for facilitation of transportation and for

ecological consideration and to develop a competent ice research group capable of undertaking long range ice research programs.

#### Goose Bay — Stephenville Marine Transportation Study

This study covered development of alternatives for loading and unloading facilities for moving roundwood by water from Labrador and the coast of Newfoundland to mills on the island with particular consideration to the Goose Bay - Stephenville route.

#### Ice Thickness Measurement

TSA co-operated with CATA, CMTA and DOE in the conduct of trials using intermediate range UHF to measure ice thickness over ice in approximately similar salinity bands. The trials were primarily to test equipment design, calibration and evaluation. The objective is to enable low-flying aircraft to provide ice thickness data for ship navigational purposes.

#### Air Cushioned Vehicle trials in the North

The Voyageur ACV was subjected to environmental trials in both winter and summer to enable engineering assessment and to test commercial viability. The trials included simulated coast guard duties at Norman Wells, N.W.T. in summer and travel over broken ice in winter.

#### Transportation of Energy

TDA is participating in the Task Force on Energy — Research & Development.

## UNEMPLOYMENT INSURANCE COMMISSION (UIC)

### Responsibilities

To administer the Unemployment Insurance Act, and to provide benefits to workers in the area under the provisions of the Act. The district office in Prince George, B.C. and an office in Whitehorse serve the Yukon Territory; the district office of Edmonton in the Northwest serves the districts of Mackenzie and Franklin, except Baffin Island, in the Northwest Territories. The district offices in Winnipeg and Montreal East, serve the districts of Keewatin and Baffin Island respectively.

### Long-term Plans

To increase contact with Territorial government and settlement agents in order to raise the standard of service in the area.

claimants, and guide them in filling out their applications for benefit.

The Whitehorse office was upgraded in 1973 to a staff of three. It performs a full claims operation, retains claimants' files on the premises, and has the power to make decisions on contentious claims. The UIC in the area cooperates on an on-going basis with Canada Manpower on various employment matters, such as the Canada Manpower Centre Registration Program.

### Plans for 1974-75

As the existing service is adequate, there are no plans at present for further expansion, but the UIC operation is under continuing surveillance to ensure that the most helpful service to the public is continued.

### Review of 1973-74 Operations

The Canadian public usually deals with the Commission by mail. The Commission operates district offices only in larger centres, but employees travel throughout the area to conduct interviews to ensure adherence to the Act.

Unemployment insurance services were provided in the Yukon Territory and the Northwest Territories through the offices noted above.

In addition Unemployment Insurance Commission personnel from the Prairie region, along with representatives of other departments, visit some seven NWT settlements to be available to help claimants solve their UIC problems. This system is served the public in that area more satisfactorily than permanent offices.

The service at Frobisher Bay was expanded in 1973 by the addition of two persons to the staff; their function is to advise



## APPENDIX

## GOVERNMENT EXPENDITURES ON THE NORTH

increase of slightly more than eight per cent of the previous year's expenditures. About two-thirds of this expenditure took place in the North. The gross expenditure figure includes inter-departmental purchases and, after adjusting for these, the net expenditure was about \$340 million. Because of the difficulty of identifying net expenditure on a departmental basis, the data is displayed on a gross expenditure basis.

In Table 1, gross expenditures are set out according to spending agency and economic function. An economic function gives a general idea as to the character of the activity on which the expenditure was made. The numbers in the upper-left corner of each cell of the matrix represent the number of program activities that make up the expenditures of that cell. For example, the Ministry of Transport budgeted \$31.4 million for the economic function "Transportation/communications" and this was divided between two activities: airports and air navigation aids, and marine navigation aids.

Of the gross expected expenditure, about \$148 million or 42 per cent was budgeted to be spent by the two territorial governments but only about 13 per cent of this amount was raised by them. The remainder was provided to the territories by the transfers from the Federal Government. Figure 1 shows the magnitude of the expenditures by spending agency and Figure 2 shows the sources of the funds.

It is estimated that the Northwest Territories benefits from about \$235 million, or 66 per cent of the gross expenditures, and the Yukon from about \$79 million or 22 per cent of the gross expenditures. The residue of \$41 million either could not be allocated to either territory or the beneficiary was southern Canada. Figure 3 shows the distribution of benefits.

An indication of the governmental commitment to the social and economic development of the North is illustrated in Table 2 by a per capita comparison between federal and territorial expenditures on health, education, and welfare in the two territories and federal and provincial expenditures for this purpose in the rest of Canada. Federal and provincial expenditure data was developed from Statistics Canada reports.

Though federal and provincial expenditures for 1972-73 and 1973-74 are not yet available, it is probable that per capita expenditures on health, education and welfare is still greater in the two territories.

In the fiscal year 1973-74, gross expenditures of \$354.1 million were budgeted by the federal and territorial governments for the Northwest Territories and the Yukon, an

The reason is the higher costs usually associated with servicing low population density areas and because of the government's intent to close the gap between the quality of the services available to Canadians living in the North and to Canadians living in the rest of Canada.

Figure 1

Expenditures by Spending Agency

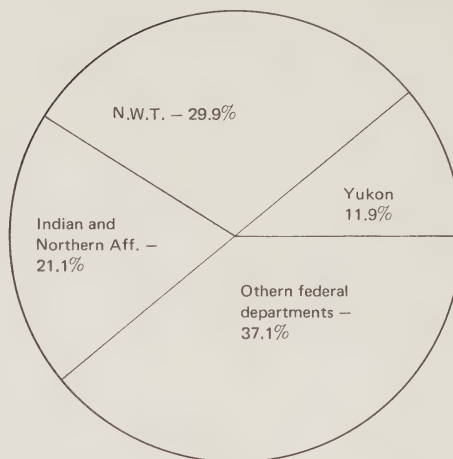


Figure 2

Sources of Funds

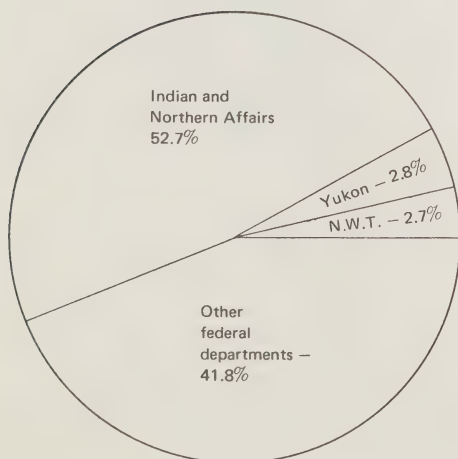


Figure 3

Distribution of Benefits

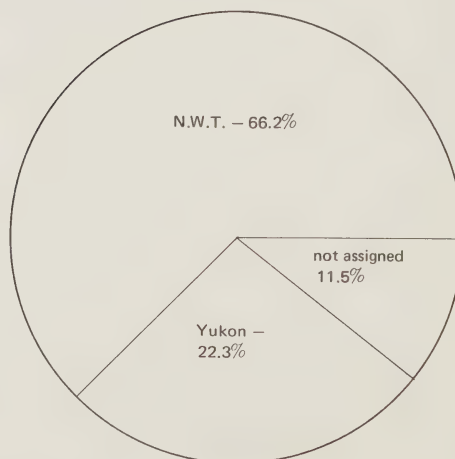




TABLE 1

Gross Expenditures by Agency and Function (\$000). Superscript denotes number of activities comprising the expenditure

Function Agency	Education	Health	Welfare	Transport & Communications	Economic Dev. & Support (Hum.)	Economic Dev. & Support (Oth.)	Defence	Local Government	Research	Culture & Recreation	General Government Services	Total Direct Expenditure	Percentage Distribution
Gov't of N.W.T.	<sup>2</sup> 30,388	<sup>3</sup> 7,850	<sup>5</sup> 11,203	<sup>1</sup> 2,395		<sup>3</sup> 6,685		<sup>2</sup> 9,099		<sup>1</sup> 1,074	<sup>6</sup> 37,303	<sup>23</sup> 105,997	29.9
Gov't of Yukon	<sup>2</sup> 9,991	<sup>3</sup> 3,286	<sup>5</sup> 5,146	<sup>1</sup> 11,730		<sup>3</sup> 1,146		<sup>2</sup> 2,616		<sup>1</sup> 668	<sup>6</sup> 7,474	<sup>23</sup> 42,057	11.9
Indian and Northern Aff.			<sup>2</sup> 6,352	<sup>1</sup> 30,295	<sup>1</sup> 2,952	<sup>2</sup> 11,711			<sup>2</sup> 3,037	<sup>1</sup> 1,302	<sup>5</sup> 19,007	<sup>14</sup> 74,646	21.1
Health and welfare—Canada		<sup>2</sup> 17,357	<sup>1</sup> 4,689									<sup>3</sup> 22,046	6.2
Manpower and Immigration					<sup>1</sup> 1,622							<sup>1</sup> 1,622	0.5
Public Works				<sup>2</sup> 1,847							<sup>2</sup> 11,333	<sup>4</sup> 13,180	3.7
R.C.M.P.											<sup>1</sup> 6,468	<sup>1</sup> 6,468	1.8
Transport				<sup>2</sup> 31,439					<sup>1</sup> 89		<sup>1</sup> 248	<sup>3</sup> 31,776	9.0
Environment									<sup>7</sup> 4,396		<sup>1</sup> 8,401	<sup>8</sup> 17,797	5.0
Energy, Mines and Resources									<sup>4</sup> 10,480		<sup>1</sup> 2,051	<sup>5</sup> 12,531	3.5
National Research Council									<sup>1</sup> 1,345			<sup>1</sup> 1,345	0.4
National Defence				<sup>1</sup> 50			<sup>1</sup> 7,994		<sup>1</sup> 3,773		<sup>1</sup> 425	<sup>4</sup> 12,242	3.5
Post Office				<sup>1</sup> 3,846								<sup>4</sup> 3,846	1.1
Communications				<sup>2</sup> 599					<sup>3</sup> 2,749			<sup>4</sup> 3,348	0.9
C.B.C.				<sup>2</sup> 3,139					<sup>2</sup>			<sup>1</sup> 3,139	0.9
Secretary of State										<sup>1</sup> 1,083		<sup>1</sup> 1,083	0.3
Other Dept's									<sup>2</sup> 285		<sup>3</sup> 700	<sup>5</sup> 985	0.3
Total Direct Expenditures	<sup>4</sup> 40,379	<sup>8</sup> 28,493	<sup>13</sup> 27,390	<sup>12</sup> 85,330	<sup>2</sup> 4,574	<sup>8</sup> 19,542	<sup>1</sup> 7,994	<sup>4</sup> 11,715	<sup>21</sup> 31,154	<sup>4</sup> 4,127	<sup>27</sup> 93,410	<sup>104</sup> 354,108	100.0
Percentage Distribution	11.4	8.0	7.7	24.1	1.3	5.5	2.3	3.3	8.8	1.2	26.4	100.0	

Table 2 Per Capita Comparison of Federal &amp; Territory Expenditures

Function	Beneficiary of expenditure	Expenditures per Capita			
		1970-71	1971-72	1972-73	1973-74
Health	Territories	\$337	\$381	\$465	\$495
	Rest of Canada	\$188	\$204	N/A	N/A
Education	Territories	\$438	\$545	\$634	\$571 <sup>2</sup>
	Rest of Canada	\$214	\$230	N/A	N/A
Welfare <sup>1</sup>	Territories	\$414	\$303 <sup>3</sup>	\$449	\$476
	Rest of Canada	\$218	\$257	N/A	N/A

1. The "welfare" function is composed of social security and assistance payments, housing expenditures, and expenditures on certain assistance programs for Indians and Eskimos.
2. The estimated per capita expenditures on education are lower in 1973-74 due to a planned decrease in capital expenditures.
3. Per capita welfare expenditures dropped in 1971-72 due to a reduction in capital spending.









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